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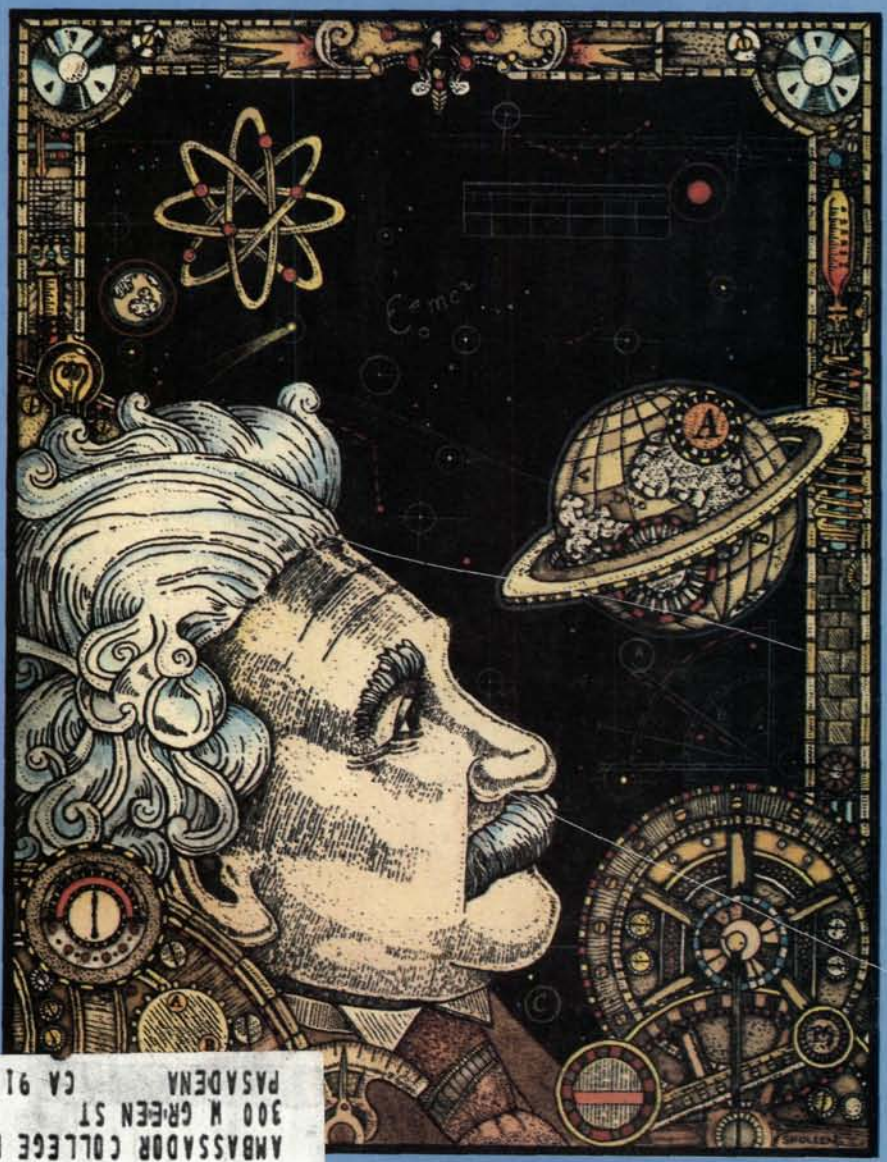

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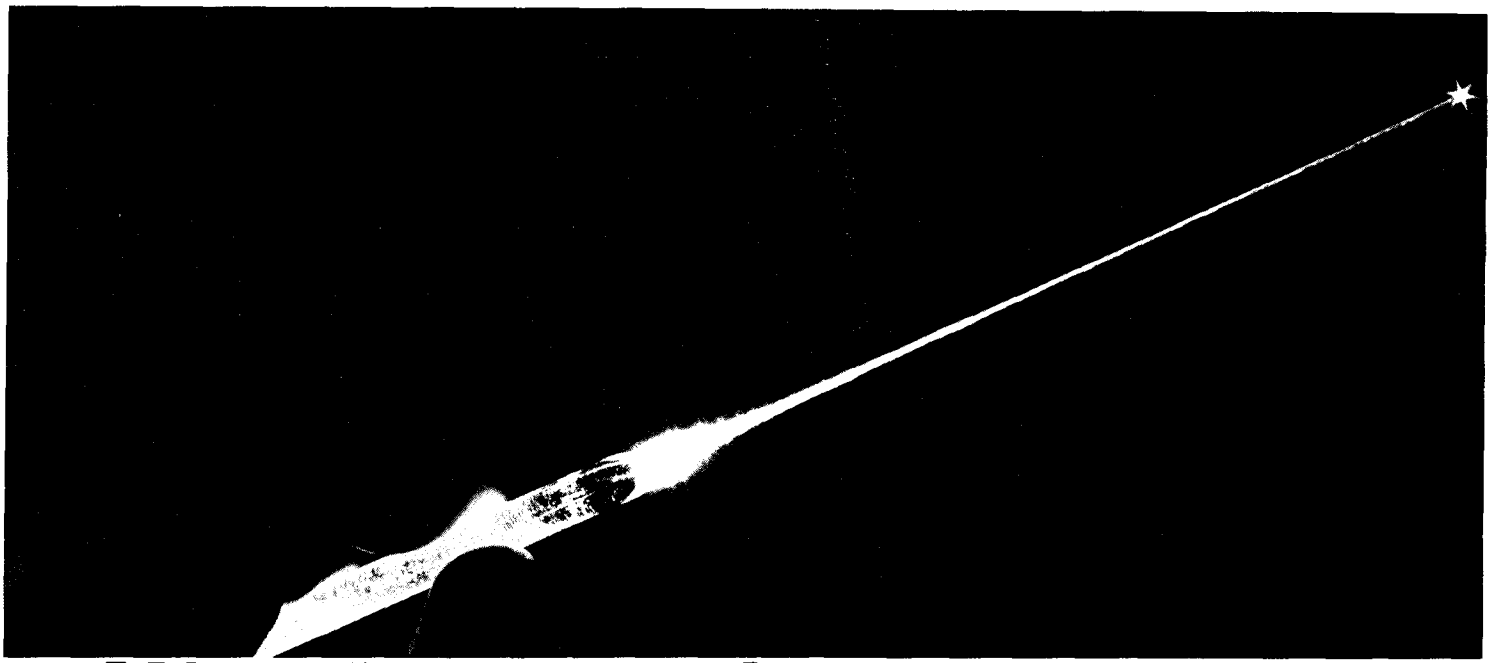

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Every new invention needs another new invention—the one that can mass-produce it at an affordable cost.

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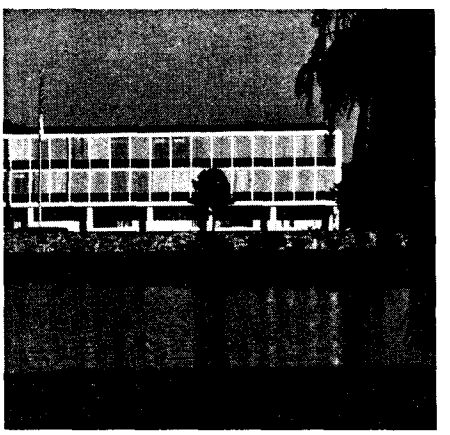

For example, while Bell Labs scientists were inventing new glass fibers, Western Electric engineers and scientists were tackling the manufacturing problems involved.

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Saturday Review

CONTENTS JUNE 9, 1979

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4 Letters

6 Front Runners

8 Editorial by N.C. *The barracuda syndrome*

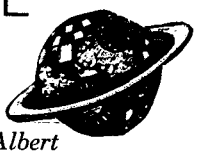
10 Top of My Head by Goodman Ace *Befitting the flag*

72 The Back Door by Carll Tucker *The end of innocence*

ISSUES

12 The Power of Fetal Politics by Roger M. Williams *Anti-abortionists have channeled their moral fury and are trying to unseat governors, senators, and even presidents in order to achieve their goal—a right to life for the unborn*

A CENTURY OF SCIENCE



Two giants of science and technology—Albert Einstein and Thomas Alva Edison—have made this a century unprecedented in human history. Its major scientific achievements have wrought revolutionary changes in the human perspective.

16 How Anxious Should Science Make Us? by Albert Rosenfeld

20 Science Goes American by Peter Gwynne

22 Pure and Impure: The Interplay of Science and Technology by Isaac Asimov

PLEASURES

45 Joys of the At-Home Generation *The Rockies may crumble, Gibraltar may tumble, and we may all learn to live with the two-dollar gallon of gasoline, but staying at home is going to be more fun than ever. Here* SR *tells why, with discussions of home electronics, early music groups, television, and records*

50 The Movies by Arthur Schlesinger, Jr. *Flics of the foreign wrist*

51 Theater by Martin Gottfried *Enter the creature*

52 Music to My Ears by Irving Kolodin *A school apart*

53 Chain Letters, War Games, Scrambled Order, Hopeless Case *Bruce Porter on B. Dalton*, et al.; *Fredric Kaplan on* The Sideshow; *Judith Gies on* Testimony and Demeanor; *Terrence Des Pres on* Optimism

61 Books in Brief

64 Wine News by Sam Aaron and Clifton Fadiman *The grapes of Rothschild*

66 Travel by Horace Sutton *Gilding the gold coast*

Puzzles Double-Crostic No. 173 (page 71);
Wit Twister No. 144 (page 5); Literary Crypt No. 132 (page 5)
Cover by Chris Spollen
Cartoonists: Clarence Brown, John Caldwell, Don Dougherty, William Haefeli

SATURDAY REVIEW published biweekly (except monthly during August and December) by SATURDAY REVIEW MAGAZINE CORP., 1290 Avenue of the Americas, N.Y., N.Y. 10019, (212) 246-9700. Subscription price in the U.S. and its possessions: one year—$16; two years—$28; three years—$36 (all other countries—additional postage $3 per year). Vol. 6, No. 12. June 9, 1979. Back issues $1.50 each. Entered as second-class mail (940460) in New York, N.Y., and at additional mailing offices. Canadian postage paid at Montreal, P.Q., Canada.

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Super Kids and Supporters Speak Up

"What's the Matter With Kids Today?" [Front Runners, March 31] was a choice bit of foolishness! Who decided that not drinking,not smoking marijuana, and indulging freely in sex in high school constitutes dullness of spirit, or that those students who care ("textbook-devouring boors") are necessarily "perversely docile?"For boredom and dull-spirited emptiness nothing compares to those kids who are heavily into sex and drugs.

Norma Helms
Munster, Indiana

The tone of your Front Runner on students in *Who's Who of American High School Students* was perhaps meant to be affectionately humorous. Instead, the article was smug, contemptuous, sarcastic, and cruel.

Shouldn't members of *Who's Who* be praised? Not only have they done well in and out of class, they have also been strong and independent enough to resist conformity.

Lisa Vodneck
New York, New York

As a student listed in the pages of *Who's Who of American High School Students* I can only apologize gently for my unredeeming virtues. I am not a bore, nor am I docile.

Jean De Santo
Pt. Lookout, Missouri

Editor's reply: Agreed. The members of *Who's Who* should be praised, and the editors of *Saturday Review* drubbed for that cranky item. Apologies to all those singed.

Natural Jewels

In "Is There Life After Yosemite?" [The New American Outback, April 14] Horace Sutton also asks "Who has been to Tuzigoot ... ?" I have. And to many other of the smaller jewels in the National Park Service's diadem.

Kudos to Horace Sutton for reminding us of their existence.

Walter Niekamp
Bloomington, Indiana

ROUND PIG IN A SQUIRREL HOLE.
THE SOPHOMORIC PUN THAT DELAYED THE GREATEST SCIENTIFIC BREAKTHROUGH IN THE HISTORY OF MANKIND.
CALDWELL

Special Offer to Saturday Review Readers

If you, like most of us editors, are bewildered about what to do when your stereo starts misbehaving, relief is at hand. Ivan Berger, the noted critic of hi-fi equipment, whose article appears on page 48 of this issue, has prepared a *Saturday Review Hi-Fi Maintenance Guide*, which we are offering to readers, free of charge. If you would like your copy of the Guide, write to us at *Saturday Review*, Department JB, 1290 Avenue of the Americas, New York, New York 10019, and maybe we can save you the trouble of lugging your turntable or tuner to the repair shop.

SR Gets a Star

Like most people addicted to language and literature, I subscribe to more magazines than I have time to read. Eventually everything gets "looked at," but I am pleasantly surprised when a magazine or book actually holds my interest from first word to last.

Such was the case with your April 28 "Love Thy City" issue. Anthony Burgess was piquant, as always. Rosenfeld, vibrant and persuading. Tavoulareas, timely. Meyer, provocative—as were Zehner, Sereny, and Maslow. N.C. and Tucker were unusually good and even Middleton's double-crostic fell victim to my pencil.

There are a number of flowery ways to say it, but altogether, you did good.

Sam A. Mackie
Key West, Florida

A Prescient Herodotus

In trivial articles, even glaring mistakes are not worth bothering about. But

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Eleanor Munro's "Archaeo-Art" [April 14] is important enough that even an error in a statement that is peripheral to its subject should be corrected. Munro refers to Herodotus' description of Nero's Golden House in her discussion of the sources that inspired the Poiriers. The *Encyclopedia Britannica* gives these dates: Herodotus, c. 484-425 B.C.; Nero, 37-68 A.D.

Robert Plank
Cleveland, Ohio

Eleanor Munro replies: My nonsensical coupling of two separate thoughts: The Poiriers quote both Herodotus and Nero's *domus Aurea* as sources of Ausée. Apologies to all. Also, in the caption to the photograph of Ausée the dimensions should be 16 by 32 feet, not inches.

Opening the Book of Medical Knowledge

Thanks for a balanced and informative view of "The Holistic Health Explosion" [March 31]. Since Claude Bernard's 19th-century studies of the internal workings of the body, medicine has seized on physiology as the grand theoretical structure to account for disease and the mechanisms of therapy. Not only has physiology given medicine its raison d'être, it has also provided the means for social separation from the laity.

I am afraid that the social-separation motive is also behind some of the new holistic cult practices and their associated profits. The overemphasis on vitamins, nutrition, and exclusive health spas is an example of holism gone commercial. Exploitation in this case means using exclusive knowledge as a lure to attract paying customers eager to learn the mysteries of health.

Medical knowledge, while it must be expressed sometimes through elaborate technology, in difficult theory, and mysterious folk practices, must be an open book for all to read.

C.T. Anderson, M.D.
Minneapolis, Minnesota

The Sequestered Statue

In the "cloak-and-dagger" obfuscations of Bryan Rostron's article, "Smuggled!" [March 31], much was left unsaid. Rostron overlooked the unhappy fact that this unique artifact is presumably now sequestered in the generally restricted and inaccessible Getty Museum.

One wishes that J. Norton Simon had acquired it as another gem for his jewel of a museum which is so generously available in Pasadena. It would have been happy among all those wonderful Rodin bronzes.

Murry Harris
Phoenix, Arizona

PUZZLES

Literary Crypt No. 132

SL SA HSLX LESTWMA,
VDP HXMD XM SA
YTT ONVEP, LXVL V
UVD EMQMVWA XSA
RXVEVRLME.

—ARXYFMDXVNME

Wit Twister No. 144

Edited by Arthur Swan

The object of the game is to complete the poem by thinking of one word whose letters, when rearranged, will yield the appropriate word for each series of blanks. Each dash with a blank corresponds to a letter of the word.

To make her weep, he ___ ___ ___ ___ ___ ___ ___ ___ the priest.
With her first ___ ___ ___ ___ ___ ___ ___ ___, purse-strings were released.
The ___ ___ ___ ___ ___ ___ ___ ___ then moved with fiscal stealth,
___ ___ ___ ___ ___ ___ ___ ___ his few fees—and seized her wealth.

Answers next issue

MAY 26 ANSWERS

Literary Crypt No. 131

Man lives by images. They lean at us
from the world's wall, and time's.
—Robert Penn Warren

Wit Twister No. 143

tangier, tearing, granite, ingrate

Middleton Double-Crostic No. 172

WILFRID SHEED: THE GOOD WORD

I heard a group complaining about Gloria Steinem's make-up. "How can she ask us not to be sex objects when she wears eyeshadow?" From a quick squint around, I would say this was like Fat Jack Leonard ... discussing Clark Gable's uppity mustache.

International Year of the Child 1979

A WHOLE APPROACH TO HEALTH

Spend 4 days in the Helderberg Mountains near Albany to discuss the too little used powers of the brain, will, emotions, energy of ideas, laughter and spirit—for life and health.

Norman Cousins, presiding throughout.
UCLA Medical School, "Humanities"
THE SATURDAY REVIEW Ed. Comm.

Walter Bortz II, M.D., Stanford U.

Raymond Harris, M.D., Cardiologist
"Aging As A Life-Long Process"

Lloyd Wescott, Medical Center Founder
"A New Role For The Hospital"

Clifford Thorn, Blue Shield/Blue Cross
"The Rising Costs"

David Green, Neurologist
Albany Medical College

Albert Szent-Gyorgyi
Nobel Laureate in Bio-Chemistry
A Statement: "The Nature of Life"

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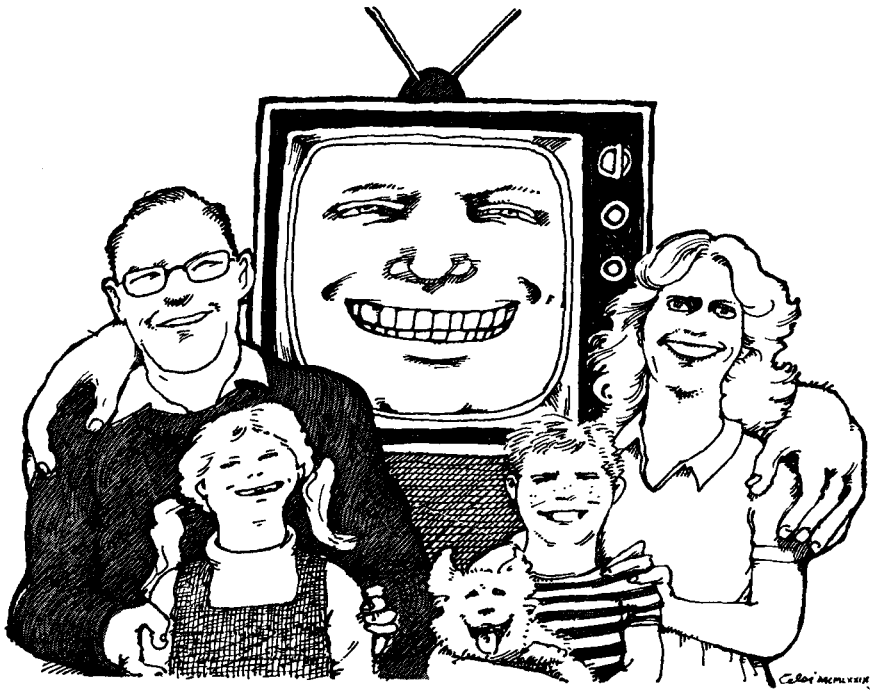

DAVID CELSI

All (That's Left) in the Family

Thoughtful parents have whipped themselves into many a lather over TV, restricting their children's watching time or banning it altogether. Since discouragement has had so little effect (the average elementary-school child watches 24 ½ hours per week), it may be time to just throw in the towel and promote the box to the role of playmate/tutor/low priest that it already enjoys. A step in this direction has been taken by the Quaker Oats Company, which is circulating copies of its "Parents' Television Guide: Useful tips about rewarding ways to watch and discuss television with your children."

The premise of the guide, which is reprinted from an article in *Learning* magazine, is that television's potential vices can be neutralized and turned to advantage by treating it as a family experience, rather like a Bible-reading used to be. Thus, in order to discover whether your child understands what's going on in his favorite sitcom, the guide recommends that "some members of the family leave the show in progress to make up their own story ending," and then compare it to the actual one.

The guide also recommends in-depth discussions of televisual reality. Analyzing camera angles with the tots helps them fight against TV's hidden persuasion. And lest the child yearn for a more Waltonesque life, he might be asked, "What things that we've done as a family would make interesting stories for TV?" Of course, the child may suggest that his parents get a new script-writer.

One question the guide neglects is, Can the joys of *Mork and Mindy* survive a free and frank talk on stereotypes, or *The Road Runner* an analysis of the consequences of violence? In fact, once the child is set to writing essays on the influence of TV, he may give up watching altogether, which was, perhaps, the insidious intention of the author in the first place.

Paradise Regained

"The mind creates, transcending these,/Far other worlds, and other seas," wrote 17th-century poet Andrew Marvell, posing the possibility of cosmic travel within the confines of the imagination. Three hundred and twenty-seven years later, in April of 1979, Dr. Joe Hart, sociometrist, psychodramatist, and gestaltist, though no poet, using "psychologically induced time warp, psychodramatic future projection, and relaxation techniques [hypnosis]," sent 20 volunteers into "another reality—a reality of existing in the ideal world in the year 2130."

Dr. Hart is a social scientist, of a distinctly modern interdisciplinary sort, at the University of Arkansas. He had already performed such modest feats as sending teams of doctors and businessmen 20 years into the future to gain insights into possible new directions for their profession. But in the April experiment he asked his voyagers to imagine a far more distant future, in order to avoid the spiffed-up, streamlined vision of futurologists, in favor of wish-fulfillment—"personal utopias," as Dr. Hart calls them. Dr. Hart describes his goals as partially therapeutic—to induce the volunteers to confront their own fantasies—and partially social—to investigate "a livable future."

The ideal world turns out to be a shade bleak. None of the participants, who spent as much as two hours roaming around the universe of the imagination, "met as many people as they expected to meet, but they found that "the relations were more significant," reports Dr. Hart. This led him to conclude that people feel a bit over-crowded at present.

Another curious discovery was a "cognitive dissonance machine" which a number of the fantasists recalled themselves wearing. The color of the device corresponded to the individual's mood, so that, as Dr. Hart explains, "If it turned red, he turned himself in for reprogramming, if it turned white, they came and got him," and so

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forth. Despite the somewhat ominous resemblance to *Brave New World*, Dr. Hart interpreted the machine as insuring that "You're never confused about reality, you don't have all these contradictory facts bothering you." Clarity will be important in the future.

Dr. Hart has big plans in the making, including transporting 1,500 members of the World Future Society into the next century, and, he hopes, sending a family together into the beyond. Asked what insights he has gained into the nature of the imagination, the modest researcher says, "I don't have any conclusions yet."

Getting Hot Under the Collar

"Reverend Swell, Mrs. Clara Hafey alleges that over a period of six years you advised her to remain married to her husband, Mr. Biff Hafey. She alleges further that in following this counsel she has suffered severe trauma, insomnia, and a chronic lower-back problem. Reverend Swell, Mrs. Hafey charges you with clerical malpractice. How do you respond to this charge?"

Couldn't happen here, you think? Well, Church Mutual Insurance of Des Moines, Iowa, has become the nation's first insurer to offer malpractice coverage for clergyman. According to Max Johnson, vice-president of Church Mutual, the Counseling Professional Liability plan was instituted after company officials noticed that more and more clergymen were looking for legal protection. Johnson can recall "dozens of instances" of suits against religious counselors, though none, as far as he knows, has led to a monetary settlement.

Coverage, which will be provided to churches as part of a comprehensive package, will cost about $20 a year and provide $300,000 of protection. The plan, Johnson admits, is a sign that times have changed. "We used to think that no one would ever hold up a church during a service, either."

GLENN WOLFF

The Good Old Days at Harvard

Harvard University has offered conclusive proof that history repeats itself. Ten years after the administration forcibly ejected a group of unruly demonstrators from its campus, it gave the boot to a United Artists team whose filming of a movie about the Sixties at Harvard apparently disrupted the college's vernal serenity.

The movie, titled *A Small Circle of Friends*, involved 300 student extras. According to a Harvard spokesman, "a tremendous number" of students and faculty members complained about restricted access to buildings and parking spaces. One irate professor tried to demolish a $150,000 camera, though a cameraman caught it before it hit the ground. And when some artificial snow wandered into the foyer of Massachusetts Hall, a few feet from the office of university president Derek Bok, Harvard decided to invoke a contractual proviso permitting it to tell the film crew to capture their ivy and Cantabs elsewhere.

The movie-makers complied, but not without a parting shot or two. Producer Tim Zinneman said, "I think Harvard's idea of disruption is different from everyone else's." Zinneman conjectured that a three-story-high mural showing American soldiers trampling on Vietnamese may have "upset some faculty members and alumni."

Nor did the irony of Harvard's imperious tactics go wholly ignored. Scriptwriter Ezra Sacks observed that the decision "shows that the Harvard administration is still living in the era the movie depicts."

Submissions

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EDITORIAL

The Barracuda Syndrome

ONE OF THE BIGGEST needs in medical education today is to attract students who are well-rounded human beings, who will be interested in people and not just in the diseases that affect them, who can comprehend the reality of suffering and not just its symptoms, whose prescription pads will not exclude the human touch, and who will take into account not just malevolent microorganisms but all the forces that exercise a downward pull on the health of their patients.

Yet consider the dilemma of the medical school. There are at least 20 applicants for every opening. Inevitably, this makes grades the most tangible measure on which the school can base its admissions decisions. Grades may be an indication of ability to learn, but when they make students fiercely competitive, the end product is not necessarily good scholarship but more often a sharpening of academic predatory skills. Admissions officers of medical schools are not unaware of these hazards, but they feel trapped. If they look for qualities of character that they know to be essential for effective medical practice, they expose themselves to possible legal action.

The effect of the Supreme Court decision in the Bakke case has been to strengthen the predominant emphasis on grades in admissions policy. Medical-school officials are now so sensitized to the possibility of other Bakke-type actions that academic standing is more important than ever before, since it represents the one criterion that will not be effectively challenged. Intangibles such as sensitivity, compassion, and rounded interests are secondary in admissions policy. Even when space is set aside for black students, selection is based almost exclusively on academic qualifications. Students with minority-group backgrounds have to compete sharply within their own group on the level of grades.

The net effect of such admissions policies is that, years before they file their applications to medical schools, students find themselves veering in the wrong direction. In effect, they are becoming drones rather than fully developed human beings. They have no time to find out what the world is about, no time to assess and pursue their other potentialities, most of which would be of value to them in any endeavor involving the healing of human beings. They have time only to prove their academic superiority over their fellows, time only to pursue the habits of grade-grabbing that will get them into and through medical school. This will not necessarily make them good doctors.

It is important to ask whether we really want to foster a barracuda psychology for young people who will have to carry the responsibility for maintaining the health and well-being of the American people. Do we really want them to be trained in an atmosphere that sharpens their teeth even more than it develops their minds? The belief by aspiring doctors that their grades have to be not only good but better than the grades of others is hardly likely to lead them into community medicine or family health care—the main health needs in America today. Such a belief is apt to lead rather to the continued pursuit of high numbers in different forms: a better address in front of which to hang their shingles, or a specialized practice beyond the economic capacity of many of the people who most need their expertise.

In a more general sense, perhaps the key question that has to be asked is whether present policies may result in graduates who are well trained rather than well educated. If we are content to be treated by technologists and computer specialists, then we should have no reason to be concerned. But if what we want are physicians who understand the extent to which each person places his or her individual stamp on a disease, physicians who help people develop the natural forces within them that combat illness, physicians who assess all the intangibles and imponderables that interfere with the full functioning of a human being, then we may want to recognize the severe pressures that play such a large part in the making of medical policy.

It is a serious error to suppose that admissions policy, or curriculum policy, is fashioned entirely outside the arena of public consensus and consent. So long as medical-school officials have to employ quantifiable standards in admissions policy, they will have little choice but to continue on the present path. But if they are encouraged by the public to search actively for the young men and women who are capable of bringing a certain artistry to the science of medicine, and who understand that good medical practice draws heavily on the sum total of human knowledge and not just on textbook medicine, then the stage may be set for wide reforms and great benefits.

There are bright signs. A number of leading medical schools, including the University of Missouri at Kansas City, Pennsylvania State University, Stanford University, and the University of California at Los Angeles, are attempting to modify admissions policy with respect to academic criteria. Two other favorable developments might be mentioned here. First, the Society for Health and Human Values has been formed by deans and professors in medical schools in order to give centrality to ethical and humanistic concerns. Second, the National Endowment for the Humanities gave more than 100 grants in 1978 to broaden the academic horizons of medical students. Obviously, that figure should be much higher; it will be, if the public becomes affirmatively involved.

An important beginning is being made; properly supported and expanded, it could lead to the finest advance in medical education since Abraham Flexner presented his famous report on medical education more than a half-century ago. —**N.C.**

Masochist of the Month

Norman Wainwright reads yesterday's television listings to find out what he missed.

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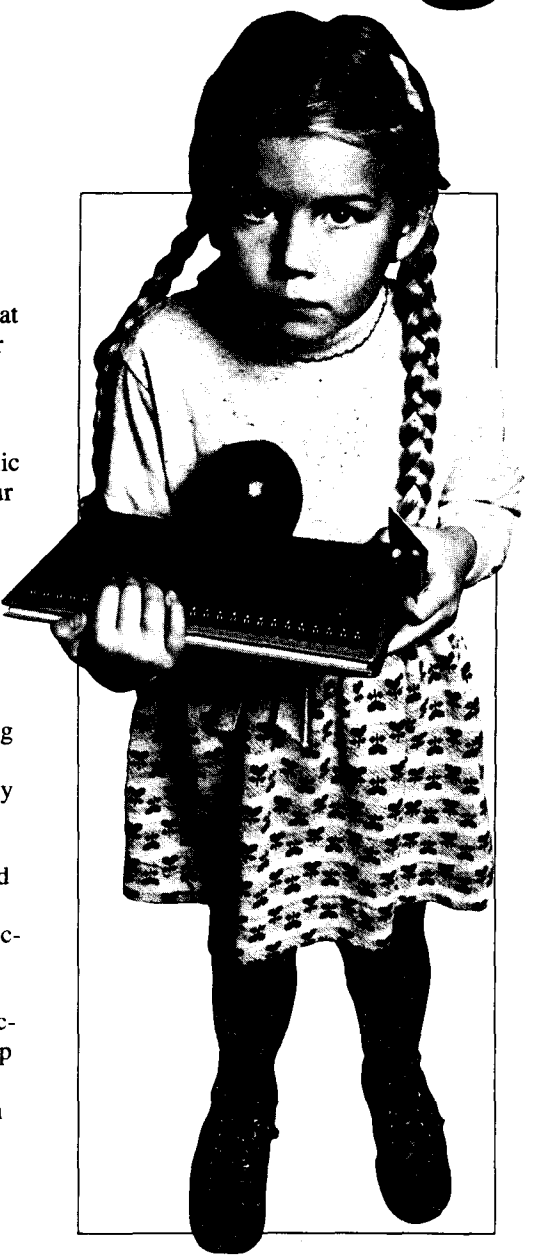
Collective Bargaining Is No Bargain.



No school again today.

And public sector union officials are trying to deceive the American public once again.

Their latest gimmick is arguing that compulsory collective bargaining for public sector unions—teachers, police, firemen, sanitation workers, etc.—will reduce strikes, calm the cities, produce better wages for public employees and generally improve our city, state and federal governments.

The truth is that compulsory collective bargaining is *no* bargain —except for the union bosses who want to increase their already too great power over all of us.

Take the question of strikes. The first compulsory collective bargaining law was passed in Wisconsin in 1959—20 years ago. There were only 15 strikes against government that year.

In 1975, after 34 states had okayed one form or another of compulsory collective bargaining in the public sector, there were 468 strikes against government.

During the same period, public sector union and association membership increased to nearly 6 million as against a little more than 1 million in 1959. In other words, public sector union membership increased 6 times in 16 years while strike activity increased 31 times.

Or take wages. In states with compulsory collective bargaining laws, teachers' salaries increased 36.6% between 1970 and 1976. Impressive? Not really.

In states where public sector collective bargaining is still not compulsory, teachers' salaries rose 40.5% during the same six-year period.

As for peace and tranquility in our cities and towns, all but seven states prohibit strikes by public sector unions. But union bosses have misled union members into striking, against the law, in city after city across our nation.

Remember the police strike in San Francisco? The firemen's strike in Memphis? The garbage and transportation strikes in New York City?

We the public wind up paying for these illegal strikes—twice.

First we pay by being denied essential public services during the strike. And then we pay a second time with our increased taxes for the wage hikes and other benefits demanded to end the illegal strike.

But as powerful as they are, public sector unions *can* be controlled if enough concerned citizens decide to take back control of their government from power-hungry union officials.

The leading national citizens lobby fighting union control of government is the Public Service Research Council, with more than 1 million members across the country. A major PSRC study is "Public Sector Bargaining and Strikes," which documents the connection between compulsory collective bargaining and strikes. (Copies are available on request from our national headquarters.)

Only an aroused and determined American public can reduce the power of ever-expanding public unions. If you'd like to help prevent union control of our government, we'd like to hear from you.

Public Service Research Council
Suite 600
8330 Old Courthouse Road
Vienna, Virginia 22180
(703) 790-0700

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Befitting the Flag

JUNE 14 IS Flag Day, so let's hear it for Mary Young Pickersgill! No, I'm not forgetting Betsy Ross, but she's only part of the story.

It all began back in 1777 when President George Washington sent a message to Congress asking it to come up with a design for a national flag. Since there are no historic papers around to indicate what Washington's message said, we can only assume it went something like this.

Gentlemen of the First Continental Congress:

I know you have all been preoccupied gathering articles of confederation, but it occurs to me that there is a matter of higher priority that should be attended to immediately. Here we are, a proud young country without a flag. It is unthinkable that we have nothing we can salute, nothing to which we can pledge our allegiance. I request that a committee be formed to design a flag and that the design be sent to Betsy Ross, the upholsterer and flagmaker in Philadelphia. She can sew the banner together so we can run it up a pole and see how it flies.

Betsy Ross's flag flew beautifully, with its 13 alternate red and white stripes and its 13 five-pointed stars on a field of blue, representing the original states. However, hers was not the flag that Francis Scott Key so proudly hailed during the War of 1812. That flag was made by Mary Young Pickersgill of the Baltimore Flag House. It was 30 by 42 feet and gallantly streamed all through the flak of bombs bursting in air. Ms. Pickersgill's flag had 15 stripes and 15 stars to represent the 15 states of the union, including Kentucky and Vermont.

The flag underwent another change in 1818, if you're interested in dates. (If facts are not your bag, then I've been lifting a lot of heavy books in vain to write this piece.) The 1818 Congress decided to drop Ms. Pickersgill's 15 stripes and revert to Ms. Ross's original 13. The reason, one can imagine, was to help us keep in mind our humble beginnings.

If you think Congress gave Old Glory a hard time, just consider what several congresses did to "The Star-Spangled Banner" before it was officially designated our national anthem.

Francis Scott Key composed the song's lyrics in 1814 on a vessel in Chesapeake Bay during the British bombardment of Fort McHenry. The following morning, it's been said, he showed the poem to his brother-in-law, who suggested he set it to the tune of an English drinking song, "To Anacreon in Heaven." Remember that date, 1814, because it gets a little tricky.

It wasn't until 1916 that "The Star-Spangled Banner" received any kind of official recognition. That year, President Woodrow Wilson ordered the military and naval reserves to play it as the national anthem. But hold everything. It hadn't yet been designated our national anthem by Congress.

There must have been plenty of complaints—like, "The song goes too high. When I come to 'and the rockets red glare, the bombs bursting in air,' my eyes bulge." Or, "My wife and I have tried dancing to it. It's not danceable." Or some super-patriotic senator could have been filibustering against the last couplet: "I don't like the finish, 'Oh say does that star-spangled banner yet wave o'er the land of the free and the home of the brave.' We all know damn well the flag still waves, and it always will wave. That line should be more positive—like in the song, 'Yes, Sir, That's My Baby,' and I don't mean maybe."

Nevertheless, and notwithstanding any standing ovation the senator may have gotten for his moving rendition of "Yes, Sir, That's My Baby," the Congress finally designated "The Star-Spangled Banner" our national anthem in 1931—117 years after it was composed. That's about the longest stretch of do-nothing congresses in our history.

Once it was decided on as the song most befitting our flag, it lost no time hitting the charts. Despite all those dilatory congressmen, today it's even bigger than the Bee Gees. Yet, one wonders unhappily what it would be like today if the super-patriotic senator's version had prevailed. Oh say can you see thousands of baseball fans rising in unison, with hand over heart, saluting our flag, and lustily singing, "Yes, sir, that's my baby. No, sir, I don't mean maybe." ?

No, I'm afraid not. And I don't mean maybe. Although that version does swing, it does not capture the veneration due the American red-white-and-blue. Whether it be Betsy Ross's or Mary Young Pickersgill's.

—Goodman Ace

"Look, a fingernail, or a lock of hair, okay, But a rib?!"

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OVER-REGULATION COULD COST YOU YOUR BUSINESS.

The paperwork alone could strangle your business. Last year the Federal government spent $20 billion just to print, process and store its own forms. And businesses like yours spent another $32 billion filling them out. With small companies picking up over half that tab. Then there's the cost of compliance with often unreasonable demands. Demands which dictate not only what you should do but how. And that "how" can be expensive. So expensive, in fact, it could drive you out of business. Add it all up. The cost of over-regulation comes to a whopping $150 billion a year. We, in the cotton industry, think it's time to get more reason into regulation. For more information write: National Cotton Council, Dept. 100, Box 12285, Memphis, Tennessee 38112.

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The Power of Fetal Politics

by Roger M. Williams

THE MOVEMENT HAS many faces: from sweet ladies handing out red roses and right-to-life cookbooks, to demonstrators brandishing bottled fetuses and hoodlums attacking medical clinics. It has many voices as well: from righteous ministers preaching the sanctity of unborn souls, to editorials raising the specter of the holocaust, to crowds screaming "murderer" at elected officials who take a different position.

This is the anti-abortion movement, a cause that refuses to yield. Six years ago, the U.S. Supreme Court ruled that the right to have an abortion is beyond the reach of government. Since then, public-opinion polls have consistently shown that a majority of Americans favors making abortion a matter for patient and doctor to decide. Despite these developments, the subject is more politically explosive today than ever before. Opposition to abortion has become the most implacable, and perhaps the nastiest, public-issue campaign in at least a half century.

Anti-abortion forces are eagerly preparing for the elections of 1980 and beyond. U.S. Senators and Representatives, as well as many lesser officials, are being targeted for defeat. Even the forthcoming presidential race is within the movement's sights. "We hope to have at least one of the nominees on our side," says a national anti-abortion leader, "but in any case I assure you we'll have an impact."

Trumpeting their own future influence is part of the basic strategy of most political-pressure groups. But the anti-abortionists have demonstrated that they have muscles as well as mouths. In the 1978 elections they sent severe tremors through the political landscapes of such states as Minnesota and Iowa. In New York, running a gubernatorial candidate whose sole issue was opposition to abortion, they drew 132,000 votes and secured for their Right to Life party an official place on the state ballot.

During the past 18 months, the movement has secured passage of abortion-restricting legislation in a dozen states and municipalities and laid the groundwork in a dozen others. Fourteen of the necessary 34 state legislatures have passed a call for a constitutional convention aimed at outlawing abortion. In addition, both houses of Congress are being bombarded with prospective constitutional amendments that would accomplish the same purpose. (Some versions make allowances for situations where the mother's life is threatened and for other so-called hard cases.)

Says former Iowa Senator Dick Clark, on whom the anti-abortionists successfully trained their fire last November: "For candidates like me, with a clear-cut voting record on abortion, I see nothing but trouble ahead. The fact is that we're facing a small but very dedicated minority. A while back, I wouldn't have thought their constitutional amendment had a decent prospect. Now, I wouldn't underestimate its chances."

The gloom should not be spread too thick. It can be argued that, in their targeting of 1978 electoral candidates, the anti-abortionists lost as many battles as they won. Michigan Governor William Milliken was reelected despite having angered opponents of abortion by twice vetoing legislation that would have secured one of their principal goals—the elimination of government funding for the operation. In New Jersey, Illinois, and elsewhere, candidates running campaigns based on a right-to-life appeal were heavily outpolled.

Nonetheless, right-to-life successes are sufficiently numerous to demonstrate that the anti-abortion movement has become a significant political force. The question is, How long can it hope to remain one? What chances does it have of sustaining its bright blue flame of moral fury?

THE WAR OVER abortion has an unusual history. Before the mid-1960s, opponents of abortion were in complete control. Then, within a six-year span, "pro-choice" activists—those who think abortion is a matter for the woman herself to decide—achieved a series of stunning successes: laws that legalized the practice in 18 states; court decisions invalidating prohibitive statutes in a half-dozen other states; and finally, in January 1973, the Supreme Court ruling that gave women an absolute right to have an abortion during the first three months of pregnancy and that severely limited state intervention through the sixth month.

Success, as it turned out, came too easily. The advocates of choice found themselves, like an armored column that has raced deep into enemy territory, outstripping their lines of supply. "The country wasn't with us at that point," concedes Karen Mulhauser, director of NARAL (National Abortion Rights Action League), the leading pro-choice organization. "Had we made more gains through the legislative and referendum processes, and taken a little longer at it, the public would have moved with us."

The Supreme Court decision spurred a number of statewide anti-abortion organizations into forming a National Right to Life Committee (NRLC). Although a welter of other groups is now at work on the issue, NRLC is the acknowledged kingpin. With chapters in all 50 states, it serves as the movement's general lobbying office, clearing house, and strategy center. NRLC maintains especially close ties with the Life Amendment Political Action Committee (LAPAC), which is spearheading the campaign for a constitutional amendment; their offices are located side by side in Washington's National Press Building; until recently, the two organizations were headed by a husband and wife—Judie (NRLC) and Paul (LAPAC) Brown.

Paul Brown (Judi has retired) cheerfully describes himself as a political amateur, a status that always enhances the image of pressure groups. Brown, 40, left a job as manager of a K-Mart store to direct LAPAC. "For the first nine months, the organization consisted of me," he says, "and for three of those months I got no pay." NRLC and LAPAC raise money without the services of pro-

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fessional, conservative-cause fund-raisers; and, if one believes their figures, they spend it with striking cost efficiency. According to the Federal Elections Commission, LAPAC last year reported expenditures of $95,000, with a mere $7,000 of that split among eight candidates who the committee was especially anxious to see win. NRLC's own political-action committee reported no expenditures at all—a strange foundation for any sort of political action.

At the state level, anti-abortion groups have been working even greater apparent miracles. In Iowa, Senator Clark seems to have been unseated for little more than would buy a new car. In New York, the anti-abortion gubernatorial ticket spent a mere $75,000, most of it for a final-week TV campaign. In state after state, the anti-abortionists' reported expenditures are almost trifling.

Big bangs for small bucks is only one of the surprises that spring from the anti-abortion movement. Most of them involve impressive rationalizations on the part of people who form the mainstay of the movement. It is curious, for example, that Americans who feel most threatened by minorities and the poor are often the most determined to see that their babies are born. The same people are usually hostile to "big government," yet they urge government at all levels to intervene in the personal lives of adult citizens. On a different track, one finds Southern fundamentalist Protestants, who once despised Roman Catholics only a little less than blacks, now making common cause with Catholics on the abortion issue.

The movement transcends these inconsistencies by means of the extraordinary passion of the anti-abortion cause. While right-to-life activity does draw strength from the fears and phobias it holds in common with the New Right, it has a purpose and a life of its own. In our most recent broad-based social movements—civil rights, women's liberation, opposition to the Vietnam War—only the extreme fringe has been unwilling to compromise, to make gains piecemeal, to judge candidates for office on some basis other than the movement's own issue. Among anti-abortionists, however, everybody is hardline. For them there is no give and take. A political candidate earns his tireless support or scathing opposition solely by virtue of his position on abortion. (There are *some* limits. When a Missouri Ku Klux Klansman ran for Congress on a pro-life platform, reports a leader of NRLC, "we couldn't support him.")

This singlemindness—this "devotion," as its practitioners see it—gives rise to the charge that the anti-abortion movement carries one-issue politics to the extreme. Missouri Representative William Clay put the matter forcefully last year when he told his congressional colleagues that, while he personally doesn't believe in abortion, "I am sick and tired of seeing [efforts to prohibit it] pop up on every piece of legislation. ... It has become an albatross for all legislation, regardless of merit." Clay could have cited District of Columbia statehood as a case in point. Last year *The Wanderer*, a national Catholic newspaper, urged the faithful to oppose D.C.'s statehood on the ground that the new Congressmen would be "virtually certain to be pro-abortion."

The anti-abortion retort amounts to a paraphrase of Barry Goldwater's dictum about extremism and virtue; the defense of life, they insist, transcends all other concerns. Furthermore, they say, many of the complainers were themselves single-issue crusaders. "The black vote, Vietnam—those were strictly one-issue," says LAPAC's Paul Brown. Playing a favorite trump card, he adds, "If you thought a candidate was right on every issue but freedom of the press, would you vote for him?"

Justification based on past movements is only partly convincing. As MIT political scientist Walter Dean Burnham says, "The right-to-lifers *are* doing what others have done, but with a major difference in intensity. The emotional charge coming from opposition to abor-

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tion is greater than from civil rights or the right to bear arms or any similar cause. The people who are dedicated right-to-lifers really believe that, in a special religious sense, they are doing the Lord's work."

THE EFFECTIVENESS of the anti-abortion movement stems largely from the wide front along which it attacks. From presidential campaigns to municipal ordinances, the movement slugs away at one or another aspect of the issue.

At the *presidential* level, the movement's influence is indistinct and unpredictable. Theoretically, it could be felt in two ways: through the personal preferences of the major-party candidates or through the influence of convention delegates on party policy. At least for 1980, the latter prospect seems highly unlikely, despite the fact that LAPAC actively encourages right-to-lifers to run for delegate posts; neither party is prone to write a strong platform plank on an issue like abortion.

As for presidential candidates, the movement's prospects appear to be only slightly better. None of the Democrats' 1980 hopefuls is anti-abortion, although President Carter himself is publicly opposed to Medicaid funding of the procedure. Two or three of the probable candidates for the Republican nomination—Ronald Reagan, Philip Crane, perhaps John Connally—are anti-abortion to some degree; but it is at least questionable whether any of them would be willing to thrust the issue to the forefront of a campaign.

At the *congressional* level, the movement has much to show for its efforts. In each of the past three years, Congress has enacted the so-called Hyde Amendment, which prohibits the use of Medicaid money to pay for abortion—and, in the process, discriminates against women who cannot afford private medical care. Congress has also voted to deny government abortions to military personnel and their dependents and to Peace Corps volunteers.

LAPAC has received welcome notoriety from its congressional "hit lists"—rosters of Senators and Representatives who, in its view, must be defeated. "Our [candidate] ratings are 100 percent or zero," says Brown. "There's no middle ground. Take Senator Frank Church [D-Idaho]. He's furious with us because we've targeted him in next year's elections. But Church would accept a 'state's rights' constitutional amendment—to allow individual states to choose whether or not to permit abortion. And he votes for Medicaid funding of abortions. Hell, if he believes in killing 40 percent of those babies, that's no better than killing all of 'em."

LAPAC claims that, as Brown puts it, "We only go after a guy if he can be beaten and if we figure we can generate at least 5 percent of the vote on our own. Some people who should be beaten can't be, or if they can, who you'd get instead makes it not worth the effort." That is sensible pressure politicking, but it doesn't quite explain the right-to-lifers' penchant for consistently right-wing candidates. On LAPAC's 1980 list, for example, there is nobody to the right of center; yet, there appear such stalwarts of the left as Senators George McGovern and Representatives Morris Udall and Robert Drinan.

Most right-to-lifers see a proposed constitutional amendment as their top priority. Says Paul Brown: 'Each day we don't have an amendment, 3,000 babies die.'

Texas Senator John Tower, a conservative who has been pro-choice on abortion, allegedly escapes the list under the "unbeatable" or "best available" provisos. According to a former anti-abortion lobbyist, Tower's immunity actually stems from the fact that he's "good on the [other] issues"—a sign that even the single-minded can bow to a higher political cause.

Political analysts are still debating the impact of the movement's 1978 hit list. The consensus seems to be that the abortion issue played a large part in the defeats of Senator Clark and Minnesota Representative Donald Fraser, who was running for the Senate, and a somewhat smaller part in the defeat of Colorado Senator Floyd Haskell. The Haskell case illustrates how tricky these assessments of influence are; if Haskell was beaten by right-to-life forces, how do we account for the fact that Governor Richard Lamm and two other major pro-choice officeholders in the state won handily?

Congress is also the zone of combat over the proposed constitutional amendment, which has become the top priority for most right-to-life leaders. Brown declares, "Each day we don't have an amendment, 3,000 babies die."

At the *state and local* levels, the movement has pushed legislation that would in effect subvert the court-upheld right to abortion. The first such law, an ordinance passed in early 1978 in Akron, Ohio, has served as a model for most of the others. It provides, among other things, that pregnant women give "informed consent" for the procedure and that parents of any woman under 18 be told of her condition. On their face, these provisions seem reasonable. But many a pregnant teenager would rather risk a surreptitious—and dangerous—abortion than the wrath of Mom and Dad. "Informed consent" usually involves issuing warnings about the emotional and physical dangers of abortion, without corresponding warnings of the emotional dangers of delivering an unwanted baby.

Thus far, at the behest of pro-choice lawyers, every ordinance or law of this nature has been temporarily enjoined by a court, generally on constitutional grounds. But efforts to enact such laws continue unabated. The efforts alone can force pro-choice adherents to retreat: In the New Jersey legislature, for example, they have compromised by introducing an informed-consent bill of their own this year. Although the most militant pro-choicers disparage such concessions, Ms. Fran Avallone, state coordinator of New Jersey's Right to Choose, says it is tactically essential: "Every anti-abortion bill that's been introduced in this assembly has passed. I know the attitudes of the men [legislators] we're dealing with, and our own version of 'informed consent' is the best we can hope to get from them."

New York's Right to Life party has demonstrated the power of this single issue—not so much in terms of total votes as of what politicians call leverage. If the major parties hereafter do not nominate "acceptable" candidates, observes Mrs. Mary Jane Tobin, the right-to-lifer's gubernatorial candidate in New York, "We *do* have the ballot line, and we'll use it. If our candidate can get 3 or more percent in the average district, we can make or break the Republican or Democratic nominee for state assembly."

At any level of political activity, anti-abortion leaders maintain, the strength of the movement lies in the eagerness and energy of its grass-roots adherents. "Our greatest ability is in generating activity," says Brown. "I can make 10 phone calls into a state—spend about $50—and have a hell of an impact." The impact comes in the form of volunteer work and in-kind contributions, that is, donations of supplies or services that normally would have to be paid for. Telephone calls, office space, and pamphlet printing and distribution are standard in-kind donations.

"We never had a campaign headquarters," says Mrs. Tobin. "We worked out of our homes. We're traditional women who have children and don't like to be far away from them." The movement also enjoys large amounts of *pro bono* assistance from lawyers and doctors.

Volunteer support is one major reason

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for the anti-abortionists' grass-roots success. The other is the cooperation of the Roman Catholic Church and the ready availability of its vast organizational framework. Granted that the right-to-life theme stirs the hearts of many Protestants and some members of other faiths, it finds the bulk of its adherents among Catholics; for them, abortion for any reason amounts to taking the life of an innocent human being and a transgression of the Fifth Commandment, "Thou shalt not kill."

Particularly in the parishes, Catholic Church involvement is continuous and effective. While some of this involvement may be illegal, proving illegalities is very difficult. Under Internal Revenue Service regulations governing tax-exempt organizations, churches are permitted a certain amount of lobbying to influence legislation. The amount is supposed to be "insubstantial." But even if the word were interpreted strictly, which it is not, an insubstantial fraction of a budget the size of the Catholic Church's could be large indeed.

No outsider, including the IRS, knows even vaguely how much the Church and its adherents have put into the anti-abortion movement. At the highest hierarchical level is the support given by individual American bishops—perhaps half the total number in the United States—to the National Committee for a Human Life Amendment; in 1977, the bishops reported contributions of $279,000.

The Church also serves as the focal point of right-to-life activity at the grass-roots. There are abundant examples of parish connections beneficial to the movement. Says an attorney for the pro-choice Center for Constitutional Rights, Rhonda Copelon, who has amassed evidence of the connections: "Money is raised through the parishes in many ways: raffles, dances, and benefits run by church-related groups like the rosary societies and Knights of Columbus." In-kind contributions include using church rooms for right-to-life meetings and church buses to haul demonstrators to right-to-life rallies.

In addition, parishes and their priests do their own versions of candidate targeting. Pennsylvania Congressman Robert Edgar, an opponent of the constitutional amendment, recalls the final Sundays before election day in his victorious 1976 and '78 campaigns: "At every Catholic church in my district there was either a sermon or a handout concerning abortion and, at least by implication, me. I've been named from the pulpit a number of times. We were told these kinds of things are the result of a directive from the archdiocese."

Rosemarie Totaro, a pro-choice member of the New Jersey Assembly, tells of a similar experience last year. According to Totaro, literature favoring her anti-abortion opponent was distributed in the Catholic church she herself attends, and at one Sunday Mass—with Totaro among the worshippers—the priest solicited votes for all the local anti-abortion candidates. "I was really offended," Totaro said recently. "I spoke to the priest about it. All he said was that I was wrong in my position on abortion."

NARAL, which sees the Church's hand in all sorts of anti-abortion funding, believes it has caught a Long Island diocese in a plainly illegal financial contribution. NARAL charges that the diocese, in 1973, made an in-church collection of $36,000 and turned the money over to the New York State Right to Life Committee. At NARAL's behest, the justice department is investigating.

Paul Brown makes a surprisingly strong denial of alleged Catholic control of the anti-abortion movement. In fact, he contends that the Church doesn't do nearly enough in the movement's behalf. He even asserts that "Church for church, we probably get more cooperation from other faiths. Catholic officials are very paranoid about their tax status. I wish they'd *lose* the tax exemption. If they did, we'd have our amendment three days later." In the meantime, Brown says, nervous Church officials should "Go talk to God. Tell Him you weren't able to save any babies this year, but you saved your tax status."

Some of the anti-abortion rhetoric in the Catholic press is positively venal. One particularly virulent editorial labeled a local abortion clinic 'little Dachau.'

Conservative sectors of the Catholic press have maintained a steady barrage against the advocates and practitioners of abortion. Some of the rhetoric is positively venal, and there are instances of its apparently leading to violence. Two years ago, the St. Paul, Minnesota, diocesan newspaper conducted an editorial campaign against a local planned parenthood/abortion clinic, labeling it "little Dachau." Not long afterward, the clinic was fired upon and burned. Patients and staff have subsequently been harassed, and this past April, windows were broken and epithets ("killers") scribbled on the outside walls. All the attacks took place during the Lenten period. NARAL says a half-dozen other clinics around the country have been physically attacked in the past two years.

Anti-abortionists have no monopoly on gut fighting. Stacked in cartons at NARAL's Washington headquarters are pamphlets whose illustrations slam home the pro-choice contention that banning abortion will only "force" women back into "underground butchery." The contention, is, in fact, buttressed by statistics showing that almost as many women had abortions before they were legalized as have them now. But the pamphlets are excessive, displaying photographs of nude women lying dead on the floors of back-alley abortionists, as well as a grossly deformed fetus and an unwanted newborn burned to death in an incinerator. "We're not proud of those," says Mulhauser, when questioned about the pamphlets. "But sometimes this is necessary to combat the distortions of the other side."

Such a statement points up the frustration the pro-choice leaders feel in trying to match the anti-abortionists' tactical maneuvering. Some pro-choice leaders admit that they have been out-organized and out-generaled. They certainly have been out- "semanticized." The anti-abortionists have succeeded in tagging the pro-choice side "pro-abortion," while appropriating for themselves the seductive phrase "right-to-life". Professional image-makers could hardly have done a better job.

DESPITE ITS competitive advantages, the anti-abortion movement faces a very doubtful political future. Passing a constitutional amendment is difficult at best and, as the Equal Rights Amendment forces have learned, especially hard when the campaign resembles a moral crusade. To be politically powerful for more than a couple of years, the movement must push aside a pair of time-tested American propositions. One is that moral certainty and religious precepts seldom sustain political action. The other is that the pluralistic character of our society has a way of fragmenting the most passionate and seemingly unified causes.

A third, more speculative problem for the movement is what Professor Burnham calls "our system-wide political and economic crisis." By that he means a general, long-term reordering of priorities in which issues like abortion will tend to get squeezed out by such overriding concerns as energy and inflation.

All that is little comfort to the pro-choice politician now facing the wrath of a fully mobilized right-to-life constituency. In 1980 and probably beyond, anti-abortionists, given the right set of circumstances, will be able to inflict the sting of fetal politics. ◉

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A CENTURY OF SCIENCE

THROUGHOUT THE YEAR 1979, twin celebrations have commemorated the hundredth anniversaries of Albert Einstein's birth and of Thomas Edison's incandescent lamp. At scores of symposiums all over this land of theirs (Einstein was American, too—by adoption), distinguished speakers have enumerated the wildly improbable events of a scientific century that took us from the horse-drawn buggy to the interplanetary probe, from the heart of the atom to the edge of the universe, from deciphering the genetic code to making machines that can calculate rings around us. It is not the purpose of this special section to repeat the list one more dazzling time or to retell the often-told life stories of Einstein and Edison, two giants who helped shape the course of this century, but rather to focus on interplays—the interplay, for instance, between "pure" science (Einstein's forte) and "impure" technology (Edison's specialty), between scientific progress and human anxiety; in a word, to put science into graspable human perspective.

How Anxious Should Science Make Us?

by Albert Rosenfeld

IN EARLY HUMAN HISTORY a Stone Age, a Bronze Age, or an Iron Age came into unhurried gestation and endured for centuries or even millennia; and as one technology gradually displaced or merged with another, the changes wrought in any single lifetime were easily absorbed, if noticed at all. But a transformation has come about in our own time. A centenarian born in 1879 has seen, in the years of his own life, scientific and technological advances more sweeping and radical than those that took place in all the accumulated past. He has witnessed—and felt the personal impact of—the Age of Electricity, the Automobile Age, the Aviation Age, the Electronic Age, the Atomic Age, the Space Age, and the Computer Age, to name but a few of the "ages" that have been crowding in upon us at such an unprecedented rate, sometimes arriving virtually side by side. Let us use the shortcut designation the "Age of Science" to encompass them all.

Our era has also been widely known as the Age of Anxiety, especially since the publication of W. H. Auden's poem of that title in 1947. Not that the poet was responsible for generating the feeling. He merely captured it, gave it a name, and made us more aware of its pervasiveness. Thirty-two years later, the anxiety has not gone away; if anything it has been heightened. How much of it can be attributed to the accelerated acquisition of scientific knowledge and its widespread applicaton? Plenty.

It would be an exaggeration to say that the Age of Anxiety was brought on by the Age of Science. There is no way to measure precisely how much of our anxiety is directly related to science and how much to other factors in our lives. But there seems little doubt that science (and I include technology) has been a major producer of anxiety.

Science's contribution to anxiety did not begin with this past century. When Copernicus and Galileo finally got their messages through, for example, we could no longer believe in a stationary earth around which the sun, moon, and planets moved against the background of a stationary starscape. Once we understood the earth was not at the center of the universe, could we be so sure man was at the center?

Then Darwin and the geologists came along to offer impressive evidence that our planet had been around much longer than previously estimated and that our own species was a rather late arrival upon its face. The theory of evolution implied that we were not the products of a special creation but just one more vulnerable—albeit superior—species that had evolved from precursor creatures.

In physics, Newton's absolutes were overthrown by Einstein, and we were given relativity, the fourth dimension, mass-energy equivalence, and the space-time continuum. In our ever-deeper penetration into the heart of the atom, we arrived at Heisenberg's Uncertainty Principle, where "facts" could ultimately be stated only as probability values, where an electron could only be said to have "tendencies to exist" but not to exist for sure at any given place and time.

As we moved our intellectual explorations outward to the galaxies, we learned that the universe was vaster than we had ever imagined and that it was, moreover, expanding; that the earth would one day be colder than ice, but only after it had been burnt to a crisp in the death throes of the sun; that the universe itself would one day die.

On a personal level, meanwhile, Freud had appeared on the scene to reveal to us our messy Unconscious and to introduce us to the world of childhood sexuality. It is hard to say to what extent he and his successors—including Kinsey and Masters and Johnson—contributed to the current relativity of our sexual morality, but we scarcely seem to know anymore when we are sinning and, if so, against what.

Even a quick, cursory glance at recent scientific history, then, suffices to demonstrate how thoroughly our perceptions of our selves and of our world have been overhauled. But to talk of the anxiety-producing factors implicit in scientific insight and discovery is only half the story.

The other half lies in what science and technology have directly *done* to us. Merely to think about nuclear energy is to be aware of anxiety all the way from the bang at Hiroshima to the near-whimper at Three Mile Island. We feel menaced on all sides by countless substances that have polluted our air,

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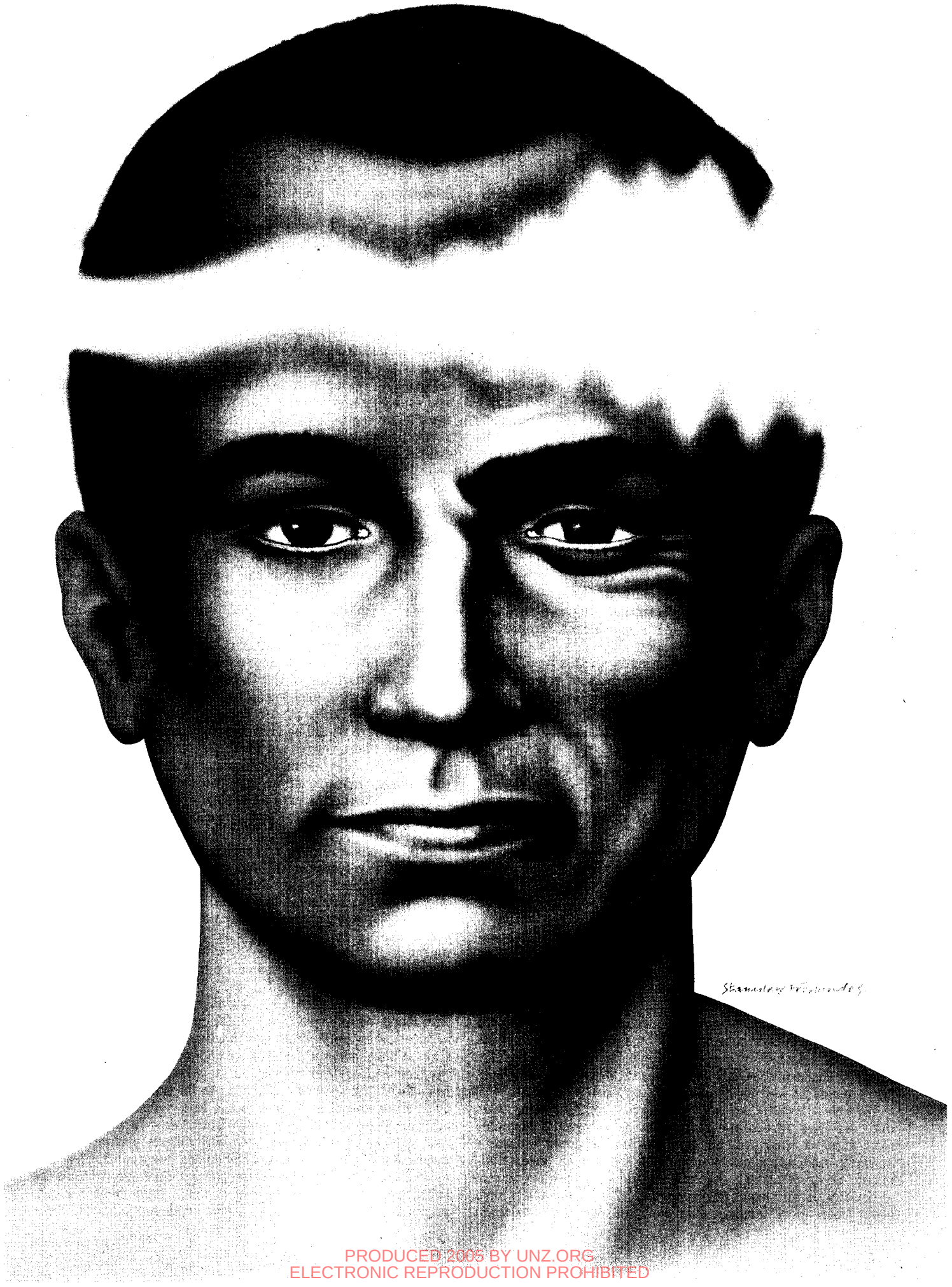

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An *absence* of anxiety is almost as great a handicap as over-anxiety.

water, and food, substances that—either separately or acting together in synergy—might trigger or accelerate a spectrum of health-draining syndromes and diseases. The rapid computerization of almost everything has made us fear a trend toward depersonalization and dehumanization, not to mention the accessibility of our most secret dossiers to any curious inquirer. Technology has speeded up the pace of our lives, adding a host of new pressures and stresses. The biological revolution arrives now, too, with its test-tube babies and genetic engineering. Not to be anxious would be foolhardy.

We must remember, of course, that science can be—and has often been—the *reliever* of anxieties as well. It has provided, for instance, the means to keep our bodies, homes, and workplaces warm in the coldest climates and to keep them cool when it is hot outside. Science lights up our darkest nights. It puts us in quick touch with anyone near a telephone. It provides easy transportation to carry us wherever we might wish to go. It produces an endless array of products for our pleasure and enlightenment. It offers cultural delights to the masses that were once available only to the elite.

One anxiety-producer has always been the prospect of illness and premature death, for ourselves and for those we love. In this area biomedical science has been credited with allaying or removing any number of specific anxieties—through vaccines and drugs against many infectious diseases, through a sharp reduction in infant mortality and a considerable extension of the average life expectancy.

As a matter of fact, until very recently in this heady century, we tended to emphasize the blessings of science and technology, to accept the benefits without much question while paying little attention to the risks—content to identify

How much harder is it to be serene, knowing we are the transient inhabitants of an unresting speck of cosmic dust?

every new smokestack, every escalation of velocity or power, as a sign of progress. By and large, we entertained the conviction that, whatever problems might arise, we could count on science to solve them.

Disillusionment has only recently set in with the realization that we had been blithely charging ahead without giving any serious thought to the long-range consequences of our technological decisions. The earth had always seemed so large, its atmosphere and oceans so boundless, its energy resources so unlimited. What contaminants could not be blown aloft by the winds or carried away by swift-running currents to the sea depths? But now we have been made painfully aware that the planet is finite, as are its supplies of air, water, and energy, as well as its capacity to absorb pollutants.

We know that the aerosol suspensions from our spray cans may endanger the ozone layer, that asbestos-dust particles may give us lung cancer. And we have reacted violently against science, becoming suspicious of what we once so admired. Some of us have become virtual neo-Luddites in our antipathy to all things technological. The doomsayers have never been more strident than now, and we listen to them intently and with ever increasing anxiety.

THERE ARE AT least two kinds of anxiety that afflict us. One is our specific anxiety about the personal circumstances of our everyday lives. The other is the existential, cosmic anxiety having to do with the human condition in the universe. Science and technology have copiously fed both.

What does a human being need, anyway? The psychoanalysts who write about anxiety—among them Rollo May, Heinz Kohut, Robert Jay Lifton, and Willard Gaylin—all emphasize the importance of a healthy self-esteem and a strong self-concept, along with at least minimal feelings of security and stability and a sense that what one does matters in the world. These qualities and convictions are difficult enough to attain under any circumstances. But under the stressful conditions that govern the lives of so many parents today, it is doubly difficult for their children to develop the characteristics best suited to cope with anxiety. Moreover, the circumstances of the children's lives, as they become adults, render it yet more difficult to retain self-esteem and a strong self-concept, to feel secure and stable in a world that changes with such bewildering rapidity, to feel that what they do matters when they are so often at the mercy of forces outside their control, of decisions arrived at without their consultation.

We may imagine how different our outlook might be if we still lived in a pre-Copernican world, with the earth fixed in place, the unquestioned center of the universe, created for us to have dominion over, and we ourselves the main purpose and focus of creation and of the Creator. We would still possess a sure sense of right and wrong (though we might deviate occasionally from the rules). Even amid these certainties, however, there would be anxiety; even in pre-Copernican days there was plenty of reason for it.

How much harder is it, then, to maintain a modicum of serenity, knowing that we are the transient all-too-mortal inhabitants—members of a perhaps ephemeral species—riding an unresting speck of cosmic dust, itself mortal; lost in an insignificant corner of just another galaxy, one of billions like it and billions unlike it, all moving away from one another at astonishing velocities. And what if, on that speck of dust, we understand that our life-support systems may be running out? And that our more irrational fellow passengers on our isolated planetary spaceship may now command the means to accelerate its demise? What kind of person does it take to maintain, in the face of such knowledge, a high self-esteem, a strong self-concept, a sense of security and stability, a faith that there will even be a future?

Analysts and child-development experts tell us that one of the deepest anxieties of our infancy and early childhood is separation anxiety—the fear that we will be separated from those whose love and support we depend on. Most of us probably never altogether master our separation anxiety; it keeps resurfacing at critical moments. As for adulthood, one of its overriding anxieties is tied to the knowledge of death. "The omnipresence of anxiety," says Rollo May, "arises from the fact that, when all is said and done, anxiety is our human awareness of the fact that each of us is *a being confronted with nonbeing*." The knowledge lies heavy upon us, though we usually keep it somewhere off in the periphery of our consciousness, along with our malaise about our planet's fate.

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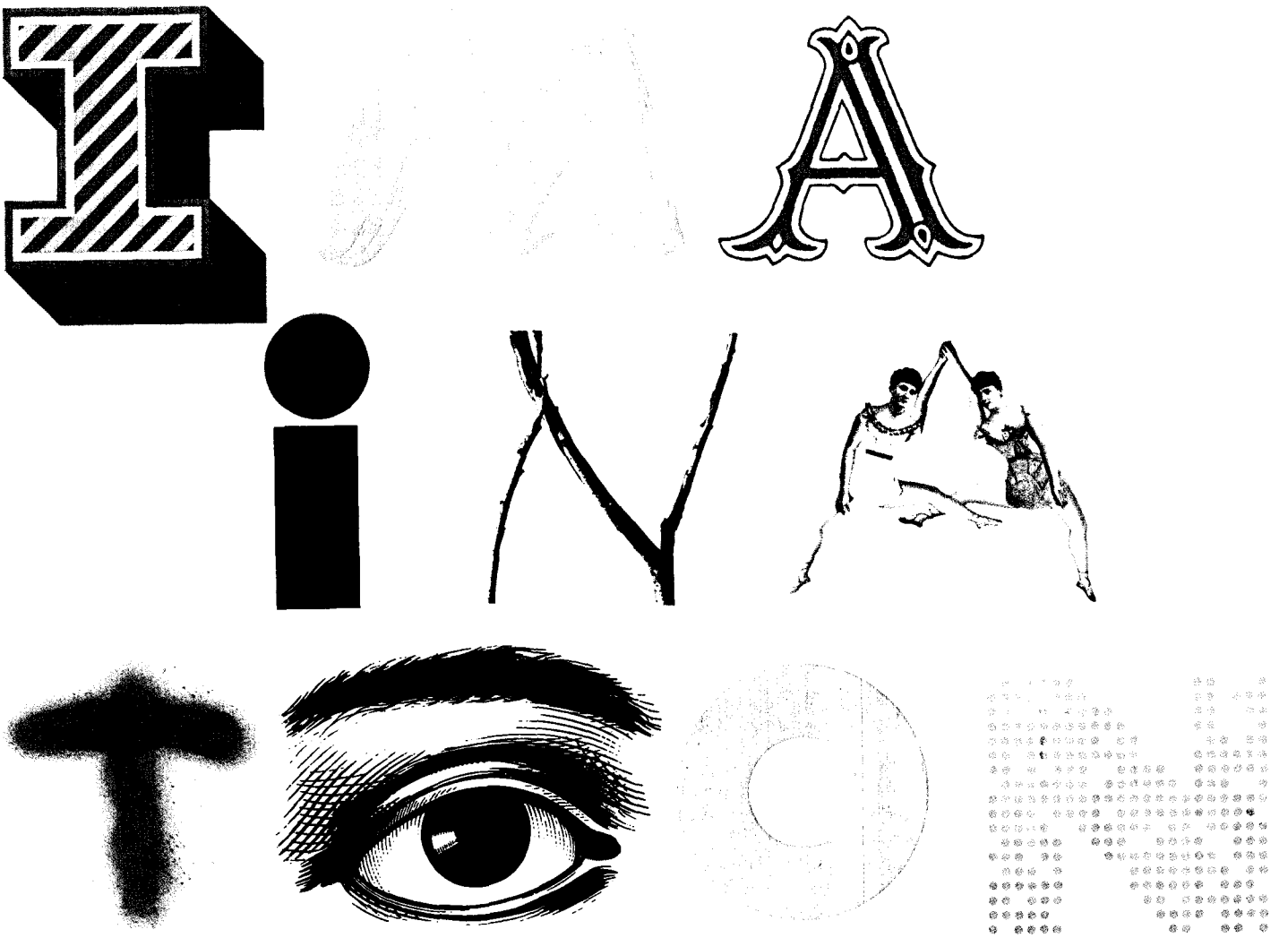

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We are free—or relatively so—and anxiety is what freedom costs us.

MEANWHILE, WE SEEM destined to continue living with science and technology. There is no going home again—if home it ever was—to the pre-Copernican era, or even to the pre-nuclear era. We also seem destined to continue living with anxiety. How can we minimize it? How should we deal with it? And with science and technology?

There is of course no sure set of recipes to offer. But there are clues to be gleaned from psychiatric case histories as well as from more systematic studies. It seems clear, for instance, that an *absence* of anxiety is almost as great a handicap as over-anxiety. In a study of patients preparing to undergo surgery, Irving Janis at Yale found that those who were not anxious at all fared almost as poorly as those who were excessively anxious. Those who came out best were the patients with normal, realistic anxieties that enabled them to carry out what Janis called the necessary "work of worrying."

There is a range of anxieties, the analysts tell us, that runs from the *pathological* through several degrees of the *neurotic* to the *normal*—including the anxiety that one might call *healthy* anxiety. To be somewhat anxious about the dangers of travel is not abnormal; but to be so anxious as to fear to travel away from one's own immediate neighborhood—the situation described, for instance, by the poet William Ellery Leonard in his psychological autobiography, *The Locomotive God*—certainly rates as pathological anxiety.

Ants are not anxious. They require neither thought nor awareness; all their answers are inscribed in their genes. But we are intelligent creatures, aware of our fate. We are also free—or at least relatively so—and anxiety is what freedom costs us. We do tend to be uneasy with freedom, and that suggests yet another way in which science has induced anxiety: It has given us a bewildering array of options. It seems pathological to back away from these options merely because we can never entirely foresee the risks; like William Ellery

Science Goes American

DURING A SOLAR eclipse in 1918, a group of U.S. astronomers set out to test Albert Einstein's prediction, made two years earlier in his astonishing and revolutionary general theory of relativity, that the sun's gravitational field would bend starlight. Their measurements showed that Einstein was wrong and the old order of Newtonian theory correct. But few physicists of world renown took much notice. At the time, science's center of gravity was firmly fixed in Europe, and when two British eclipse expeditions made measurements the following year that supported Einstein's prediction, the scientific community tossed aside the American result and acclaimed Einstein as the new Newton.

Things have changed since then. Receiving one's training and working experience in the United States doesn't guarantee success in the scientific world, but it helps enormously. During the past five years, for example, Americans have scooped up 21 of the 32 full- and part-shares of Nobel prizes awarded in the three scientific disciplines—physics, chemistry, and medicine or physiology. The American awardees weren't in the Einstein mold—that is, scientists who had emigrated to this country after a thorough training in Europe. Our most recent laureates have predominantly been educated at both undergraduate and graduate institutions here.

When did the United States start to become an appealing haven for the men in the labs, and why? Most experts ascribe the change to the creation of strong links between government and the academic world after World War II. In 1950, sparked by Vannevar Bush's vision in his report *Science: The Endless Frontier*, the federal government set up the National Science Foundation to channel government money to basic scientific research deemed worthy of support—even if the work offered no immediate promise of practical benefits.

The NSF was just one factor in an equation guaranteed to keep scientists supplied in test tubes, financial support, and academic success. The Department of Defense, the Atomic Energy Commission, and the National Institutes of Health received millions of dollars of federal funding, much of which they channeled to university research teams. The ascent of Sputnik and the resulting U.S. furor put scientists even higher on a public pedestal and led directly to the formation of the National Aeronautics and Space Administration, an agency that in its early years seemed to have a free hand to commission the best in science and technology.

Universities with major science departments thrived. Between 1962 and 1970, the number of U.S. institutions granting doctorates in science and engineering soared from 162 to 229.

Of course, it couldn't last. Starting in 1968, when then-President Lyndon Johnson remarked that scientific researchers should be more aware of the applications of their work, the proportion of the GNP going to support science started to decline, from more than 3 percent down to roughly 2.5 percent today. Shortly after, the proportion of patents awarded to U.S. scientists and engineers also started to drop, and the Japanese and West Germans began to threaten U.S. domination of the world of ultra-sophisticated technology.

Yet few U.S. scientists are ready to throw in the towel. The secret of what has made America great in science is best stated by Arno Penzias of Bell Laboratories, who shared in last year's Nobel physics prize for discovering the faint echo of the big bang that started the universe. "I'm very grateful," the 46-year-old researcher declared on hearing of the honor. "I came here as a refugee almost exactly 40 years ago. I guess it's kind of corny to say, but I've realized the American dream. I came here with nothing and end up with everything."

—PETER GWYNNE

Mr. Gwynne is this year's winner of the American Chemical Society's prestigious James T. Grady writing award.

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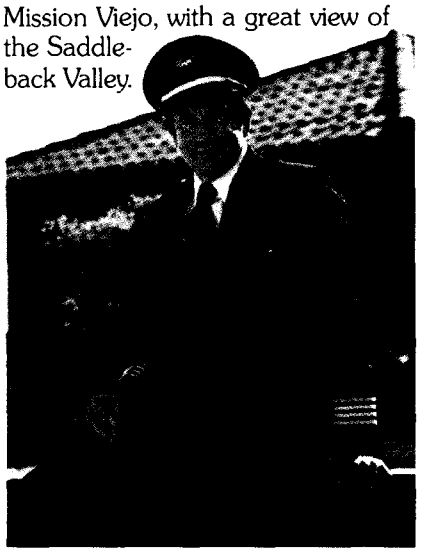

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Dr. George Roberts, Professor, University of California, Irvine.

"I learned something of value when I moved here—literally, Mission Viejo has the best housing values in this area.

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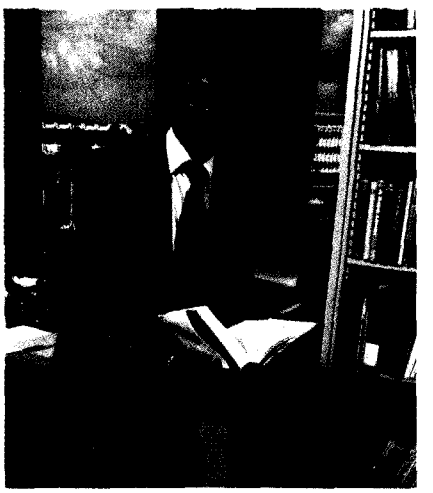

"In fact, we're already considering another move. Up, but not out, of Mission Viejo."

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Every period of crisis may be a prelude to either disaster or growth.

Leonard, we would never dare leave the neighborhood. (And then, how safe is the neighborhood?) A healthy anxiety would rather encompass a certain exhilaration at the challenges and opportunities freedom offers.

As Willard Gaylin suggests in *Feelings*, one way to alleviate anxiety—which tends to be a vague and unfocused feeling—is to turn it wherever possible into *worry*. A worry usually centers on a specific problem or concern. "Worry is easier to handle," says Gaylin. "We can tell ourselves to stop worrying because it *is* about something," and hence we may be able to do something about it.

In a sense we turned our anxieties about pollution and overpopulation into worries by organizing movements such as Earth Day and Zero Population Growth. It is amazing, in retrospect, to think how rapidly such activities succeeded in mobilizing the public's environmental awareness, galvanizing the government to set up protective agencies and actually reducing the fertility rate. We can certainly hope for a continuation of nuclear détente, and, even before the meltdown scare at Three Mile Island, we were slowing the pace of nuclear-power generation and instilling in the public a healthy anxiety as to its safety.

There are many ways to use our imaginations to bring about the kinds of change in awareness Rollo May recommended to achieve a healthy, normal anxiety. At a recent conference I attended in Monterey, California, for example, Barbara Marx Hubbard of the Committee for the Future recalled some examples which were originally put forth by that little appreciated space genius, Krafft Ehricke: He has imagined a primordial time when the first precursors of green plants were starting to photosynthesize, thereby producing oxygen. Oxygen, in those days, would have had to be classified as a pollutant. Had there been at hand a pathologically anxious organism with the power to stop this hazardous activity, there would today not only be no plants but no animals either. Ehricke also hypothesizes a tiny, intelligent organism that resides inside a developing fetus, with no experience of anything else and of course no concept of what birth is like. As the fetus passes through the eighth month of pregnancy and begins to crowd its uterine space, the anxious organism might well point out the obvious limits to the fetus's growth, predict the running-out of its life-support systems, and declare that the fetus must halt its growth or face disaster.

Every period of crisis may be a prelude either to disaster or to marvelous growth. An often-cited example is that of a silkworm en route to becoming a butterfly. Lying dormant in its cocoon, its substance apparently undergoing disintegration (actually reorganization), it could easily be perceived as being in its death throes. For all we know, the turmoil of our own chaotic time may be a harbinger of a beautiful butterfly era of civilization ahead.

I am not suggesting that we be fatuous about facing our very real threats and dangers; only that we should not draw negative conclusions hastily based purely on logic and experience. A healthy anxiety, dealing with things as they are and applying imagination to things as they might become, can lead us to hope and even good cheer.

As for our self-image: If, in contemplating our puniness in the immensities of the cosmos, we feel diminished, we should remember that the entire universe out there is merely a construct of our own intellect, extrapolated from data gleaned by dissecting starlight in our spectroscopes. A creature who can bring off such a feat should never lack for self-esteem.

"The freedom of the healthy individual," says Rollo May in *The Meaning of Anxiety*, "inheres in his capacity to avail himself of new possibilities in the meeting and overcoming of threats to his existence. By moving through anxiety-creating experiences, one seeks and partially achieves realization of himself."

We seem to be on the verge of learning so much more than we presently know, or ever thought we might know, that it would be a pity to draw back now—especially from the knowledge of life's processes. Such understanding holds the promise of alleviating, curing, or preventing most of our crippling and lethal illnesses, of adding a greater quality of vigor and enjoyment to the later years of life, even of extending the life span.

One of the problems with scientific and technological advances and the anxieties they have produced so far is that much of what has been done has been done without our prior understanding and consent. There has, fortunately, been a trend lately toward not only explaining to the public what is planned but also inviting it to participate in the discussions.

If we feel diminished by the cosmos, we should remember that the universe is a construct of our own intellect.

In the field of recombinant-DNA research—the moving frontier of genetic engineering—there have, for example, been extended public debates. In this instance, the scientists themselves had alerted the public to the potential hazards. Now, after considerable examination and re-examination, the work proceeds, but under strict safety guidelines. Handled in this manner, the research may still evoke some healthy worries about specific possible dangers—with the consequent likelihood that we'll keep a sharp eye out. But the public process will have allayed the nagging anxiety that comes with exposure to unexamined and little understood dangers that no one bothered to explain to us or consult us about.

As the Ages of Science and Anxiety proceed in tandem, then, we will perhaps be best served by listening to our healthy anxieties, letting them surface, then doing all we can to minimize our neurotic anxieties by keeping ourselves informed and by insisting on being heard—knowing that we can decide *not* to do what we choose not to; cloning, for instance, may be an example of what we choose not to do. If we can be both informed and heard, we can watch scientific research proceed apace, not only with our permission but with our encouragement and applause. We should stay healthily worried all the way but not so pathologically anxious as to foreclose a proper exploration of our options—some of which could provide the solutions to our stickier dilemmas. To the extent that we succeed with this balancing act, we can keep our self-esteem and self-concept strong, and—though we must live with ambiguity rather than certainty—we can feel that what we do does matter after all, that we are not powerless to be co-authors of our own future.◉

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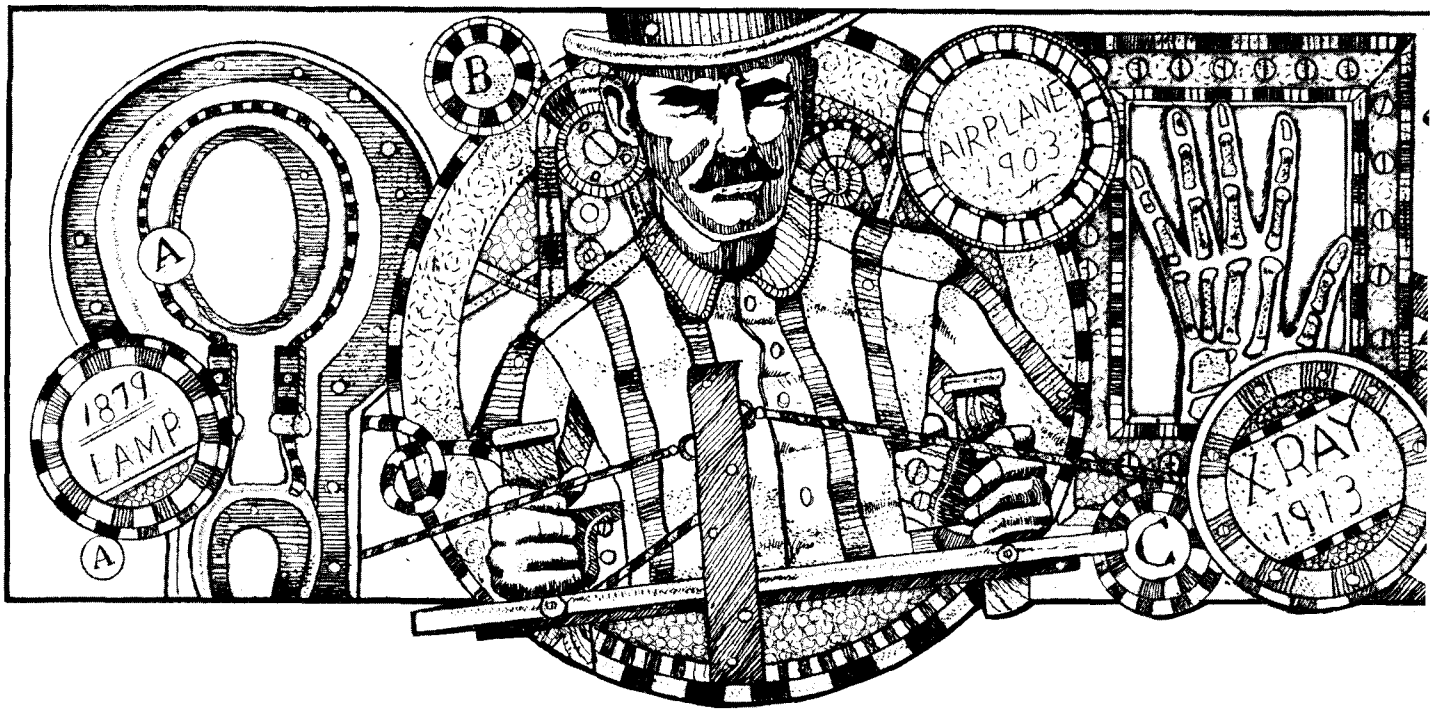

Pure and Impure

The Interplay of Science and Technology

by Isaac Asimov

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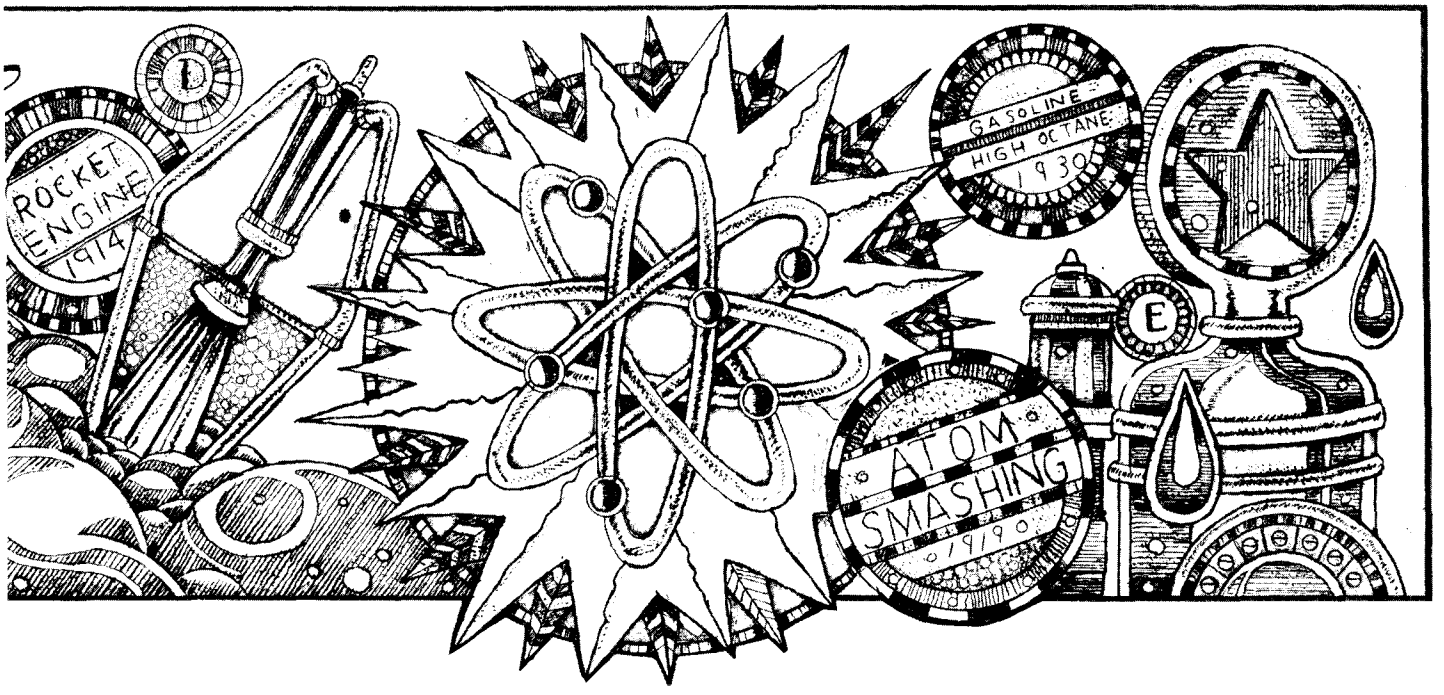

CHRIS SPOLLEN

IT IS EASY TO DIVIDE a human being into mind and body and to attach far greater importance and reverence to the mind. Similarly, the products of the human mind can be divided into two classes: those that serve to elevate the mind and those that serve to comfort the body. The former are the "liberal arts," the latter, the "mechanical arts."

The liberal arts are those suitable for free men who are in a position to profit from the labors of others in such a way that they are not compelled to work themselves. The liberal arts deal with "pure knowledge" and are highly thought of, as all things pure must be.

The mechanical arts, which serve agriculture, commerce, and industry, are necessary, too; but as long as slaves, serfs, peasants, and others of low degree know such things, educated gentlemen of leisure can do without them.

Among the liberal arts are some aspects of science. Surely the kinds of studies that have always characterized science—the complex influences that govern the motions of the heavenly bodies, for instance, and that control the properties of mathematical figures and even of the universe itself—are pure enough. As history progressed, though, science developed a low habit of becoming applicable to the work of the world and, as a result, those whose field of mental endeavor lies in the liberal arts (minus science) tend to look down on scientists today as being in altogether too great a danger of dirtying their hands.

Scientists, in response, tend to ape this Greek-inherited snobbishness. They divide science into two parts; one deals only with the difficult, the abstruse, the elegant, the fundamental—in other words, "pure science," a truly liberal art. The other type of science is any branch that goes slumming and becomes associated with such mechanical arts as medicine, agriculture, and industry—clearly a form of impure science. "Impure" is a rather pejorative adjective. It is more common to talk of "basic science" and "applied science." On the other hand, differentiation by adjective alone may not seem enough. The same noun applied to both makes the higher suspect and lends the lower too much credit. There has thus been a tendency to call applied science "technology."

We can therefore speak of "science" and "technology," and we know very well which is the loftier, nobler, more aristocratic, and (in a whisper) the purer of the two. Yet the division is man-made and arbitrary and has no meaning in reality. The advance of knowledge of the physical universe rests on science *and* technology; neither can flourish without the other.

Technology is, indeed, the older of the two. Long before any human being could possibly have become interested in vague speculations about the universe, the hominid precursors of modern human beings were chipping rocks in order to get a sharp edge, and technology was born. Further advances, by hit and miss, trial and error, and even by hard thought, were slow, of course, in the absence of some understanding of basic principles that would guide the technologists in the direction of the possible and inspire them with a grasp of the potential.

Science, as distinct from technology, can be traced back as far as the ancient Greeks, who advanced beautiful and intricate speculations. The speculations perhaps tended to become more beautiful, certainly more intricate, but there was no way in which they could have become more in accord with reality. The Greeks, alas, spun their speculations out of deductions based on what they guessed to be principles, and they sharply limited any temptation to indulge in a comparison of their conclusions with the world about them.

It was only when scientists began to observe the real world and to manipulate it that "experimental science" arose. This was in the 16th century, and the most able practitioner was the Italian scientist, Galileo Galilei, who began work toward the end of that century. Thus began the Scientific Revolution.

In the 18th century, when enough scientists recognized their responsibility toward the mechanical arts, we had the Industrial Revolution; it reshaped human life.

Such is the psychological set of our minds toward a separation of science into pure and impure, basic and applied, useless and useful, intellectual and industrial, that even today it is difficult for people to grasp the frequent and necessary interplay between them.

Consider the first great technologist of the modern era, the Scottish engineer, James Watt. Though he did not invent the steam engine, he developed the first one with a condensing chamber and was the first to devise attachments that converted the back-and-forth motion of a piston into the turning of a wheel. He also invented the first automatic feedback devices that controlled the engine's output of steam. In short, beginning in 1769, he developed the first truly practical and versatile mechanism for turning inanimate heat into work and thus started the Industrial Revolution. But was Watt a mere tinkerer? Was he a technologist and nothing more?

At the time there lived a Scottish chemist, Joseph Black,

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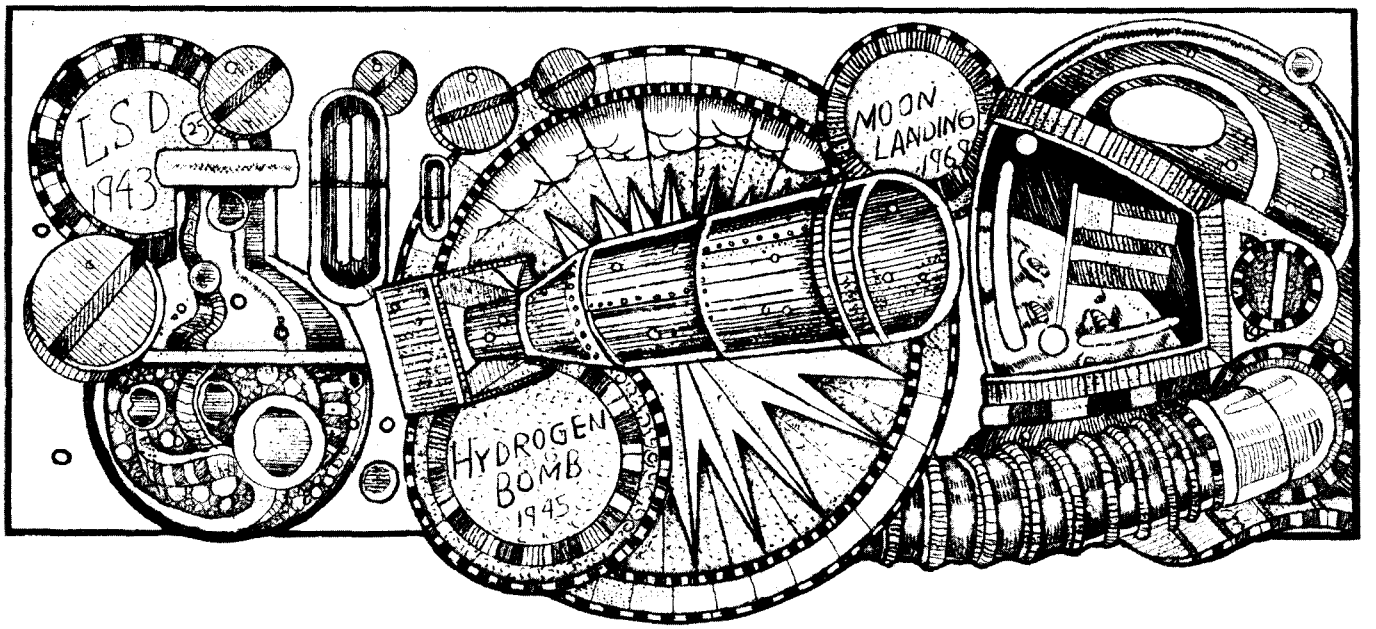

who, in his scientific studies of heat in 1764, measured the quantity of heat it takes to boil water. As heat energy pours into water, he found, its temperature goes up rapidly. As water begins to boil, however, vast quantities of heat are absorbed without further rise in temperature. The heat goes entirely into the conversion of liquid to vapor, a phenomenon known as "the latent heat of evaporation." The result is that steam contains far more energy than does hot water at exactly the same temperature.

Watt, who knew Black, learned of this latent heat and familiarized himself with the principle involved. That principle guided him in his improvements of the already existing steam engines. Black, in turn, impressed with the exciting application of his discovery, lent Watt a large sum of money to support him in his work. The Industrial Revolution, then, was the product of a fusion of science and technology.

NOR IS THE FLOW of knowledge entirely in the direction from science toward technology. While many people (even nonscientists) can now recognize that scientific research and discovery, however pure and abstract they may seem, may turn out to have some impure and practical application, few (even among scientists) seem to recognize that, if anything, the flow is stronger in the other direction. Science would stop dead without an input from technology.

In 1581, Galileo, then 17 years old, discovered the principle of the pendulum. In the 1590s, he went on to study the behavior of falling bodies and was greatly hampered by his lack of any device to measure small intervals of time accurately. The first good timepiece was not developed until 1656, when the Dutch scientist, Christiaan Huygens, applied Galileo's principle of the pendulum to construct what we would today call a "grandfather's clock." The principle of the pendulum, by itself, would have done little to advance science. The application of the pendulum principle and the technological development of timepieces made it possible for scientists to make the kind of observations they could never have made before.

In similar fashion, astronomy could not possibly have progressed much past Copernicus without technology. The crucial key to astronomical advance began with spectacle-makers, mere artisans who ground lenses, and with an idle apprentice boy, who, in 1608, played with those lenses—and discovered the principle of the telescope. Galileo built such a telescope and turned it on the heavens. No greater revolution in knowledge has ever occurred in so short a time as the second it took him to turn his telescope on the moon and discover mountains there. In brief, the history of modern science is the history of the development, through technology, of the instruments that are its tools.

Yet tools do not represent the only influence of technology. The products of technology offer a field for renewed speculation. For instance, although Watt had greatly increased the efficiency of the steam engine, it still remained very inefficient. Up to 95 percent of the heat energy of the burning fuel was wasted and was not converted into useful work. A French physicist, Nicolas Carnot, applied himself to this problem. Involving himself with something as technological as the steam engine, he began to consider the flow of heat from a hot body to a cold body and ended up founding the science of thermodynamics (from the Greek for "heat-movement").

Nor is it true that science and technology interacted only in the past. The year 1979 is, by coincidence, a significant year for two great men who seem to typify the very epitome of the purest of science on the one hand and the most practical of technology on the other—Albert Einstein, the greatest scientist since Newton, and Thomas Alva Edison, the greatest inventor since anybody. This year marks the centennial of Einstein's birth. It is also the centennial of Edison's greatest invention, the electric light. How did the work of each man invade the field of the other?

Surely, the theory of relativity, which Einstein originated, is as pure an example of science as one can imagine. The very word "practical" seems a blasphemy when applied to it. Yet the theory of relativity describes the behavior of objects moving at sizable fractions of the speed of light as nothing else can. Subatomic particles move at such speeds, and they cannot be studied properly without a consideration of their "relativistic motions." This means that modern particle accelerators can't exist without taking into account Einstein's theory, and all our present uses of the products of these accelerators would go by the board. We would not have radioisotopes, for instance, for use in medicine, in industry, in chemical analysis—and, of course, we would not have them as tools in advancing research into pure science, either.

Out of the theory of relativity, moreover, came deductions that interrelated matter and energy in a definite way (the famous $E = mc^2$). Until Einstein gave us this equation, matter and energy had been thought to be independent and

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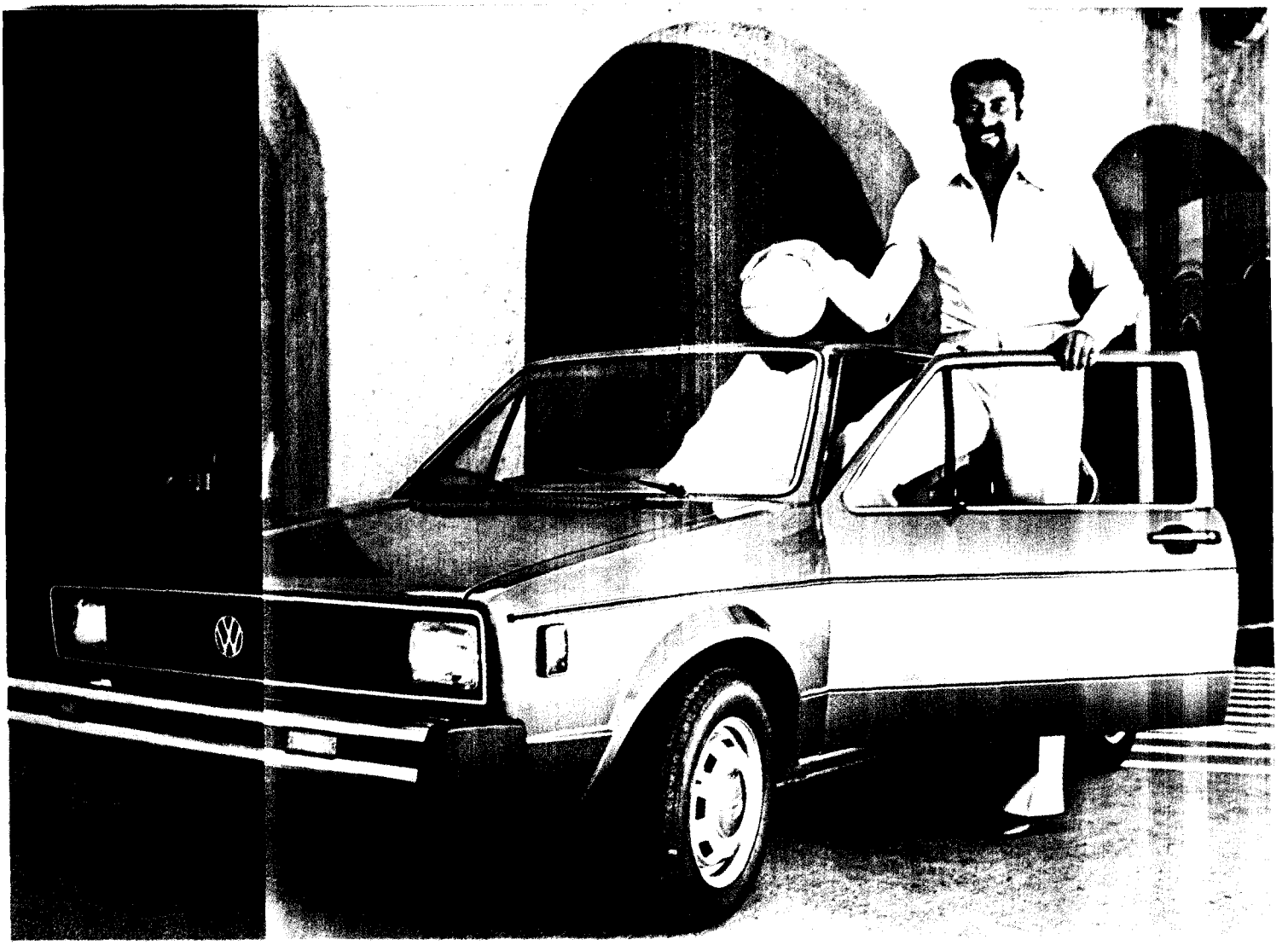

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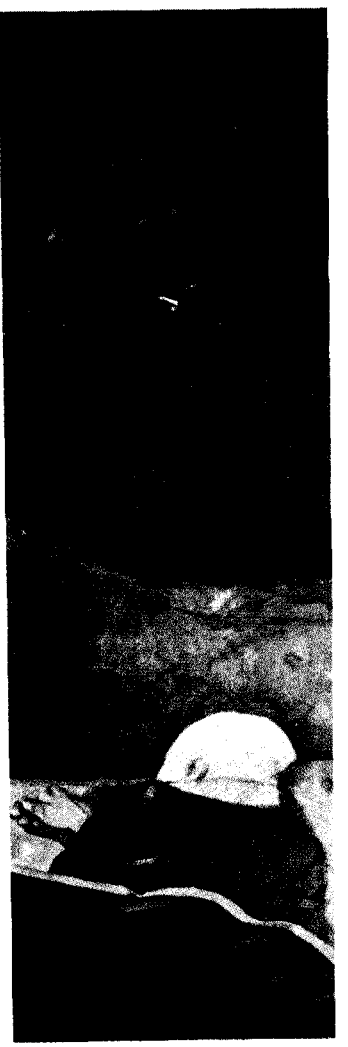
How to see tl

Vance Kirkland (Colorado), Invasion of Mysteries Near Scorpio 1977, No. 2. Collection the artist.



John Shaw (Utah), 2 No. #1, mixed media. Collection the artist.

William Wiley (California), Muse from a Lil Creep Village, watercolor. Collection the artist.

MUSE from a Lil CREEP VILLAGE. 9/5/77

DISPATCH O GROUNDAIR .. OVER 18/32 .. MEANWHILE UP FRONT THEY ARE TURNING THEIR CAMERAS INTO MICRO SCOPES .. AND GETTING QUICKLY HOW TO STOP EM ..

DEAR YOU METAPHYSIC BUD FAIR .. THE VILLAGE SQUARE WITH PROGRESS .. SALT GREEK TO ME .. THERES THE FESTIVAL OF CULTURE AND THE USUAL BULL .. IT ALL SEEMED SO DIFFERENT 10 YRS. AGO FIRST ARRIVED .. AND ITS SOMETHING GOT FAMILIAR AND STAYED STRANGE .. OR AT LEAST A LITTLE ODD. AT LEAST THE COSTUMES ARE PRETTY PRINTS .. I BEEN HERE TOO LONG OR NOT LONG ENOUGH .. EVEN KNOWING DONT HELP MUCH .. THE DILEMMA I MUST ADMIT AT TIMES GETS ME GIDDY .. THEN THERE THE OLD BORREN BORING AROUND THEN TO LONG BLACK QUIET THOUGHTS .. AT TIMES SILLY TO THINK AND INNOCENT AT THE DESERT .. MAYBE IS YOU WERE THE OCEAN LOOKING AT US .. IT COULD BE LIKE YOU LOOKING AT THE OCEANS .. LAYERS OF FEARED AND FAVORED LIFE FORMS ..

HARDLY BELIEVING DOLPHINS .. MY MY .. WELL THATS IT FOR NOW B. C. LOVE YOU ..

YOUR PAL
CAPTN CREEP MCGEE

Luiz Jimenez (New Mexico), Progress. Part II, fiber glass and epoxy. Private collection.

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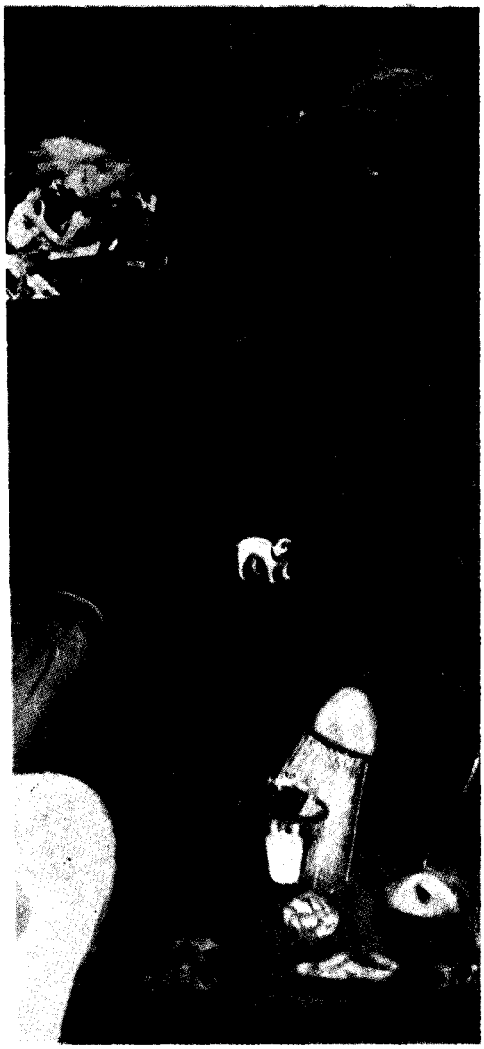
ıe big picture.

Jim Davis (Arizona), Blue Room. Collection the artist.



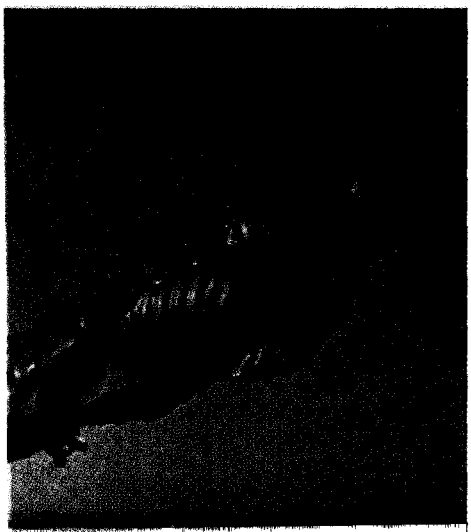


Photo credit: Courtesy of the artists

You're looking at some works which art historians, needing mental pigeonholes as much as the rest of us, refer to as "regional art." They are by contemporary American artists who happen to reside somewhere west of "The Great Divide." They're part of the "First Western States Biennial Exhibition."

And if you look at them closely, you'll see they are as "regional" as the "Florentine" Leonardo's—for their art, like his, is both partly of its time and place, and wholly universal.

Only time will tell if one of these paintings is, or leads to, the "big" picture that artists since Leonardo have strived for But no one can see the big picture of contemporary American art without seeing these artists, and their works, as part of it.

That's one reason we sponsored this exhibition and why we hope you can see it at one of the museums on the dates listed below. In our work, as in yours, we need constantly to freshen our vision with the visions of all Americans. And to remind ourselves that individual imagination, individual creativity and individual innovativeness are all readily available in every place where creative people work. Sponsorship of art that reminds us of these things is not patronage. It's a business and human necessity.

If your company would like to know more about corporate sponsorship of art, write George Weissman, Chairman of the Board, Philip Morris Incorporated, 100 Park Avenue, New York, N.Y. 10017.

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"The First Western States Biennial Exhibition," an exhibition organized by the Western States Arts Foundation. It appeared at the Denver Art Museum, Denver, CO. March 7 to April 15, 1979. Subsequent showings include: National Collection of Fine Arts, Washington, D.C. June 8 to September 3, 1979; San Francisco Museum of Modern Art, San Francisco, CA. October 26 to December 9, 1979; Seattle Art Museum, Seattle, WA. May 29 to July 13, 1980. Additional showings will be announced at a later date. The exhibition is made possible by grants from Dayton-Hudson Foundation, Philip Morris Incorporated and Mission Viejo Company as well as the National Endowment for the Arts

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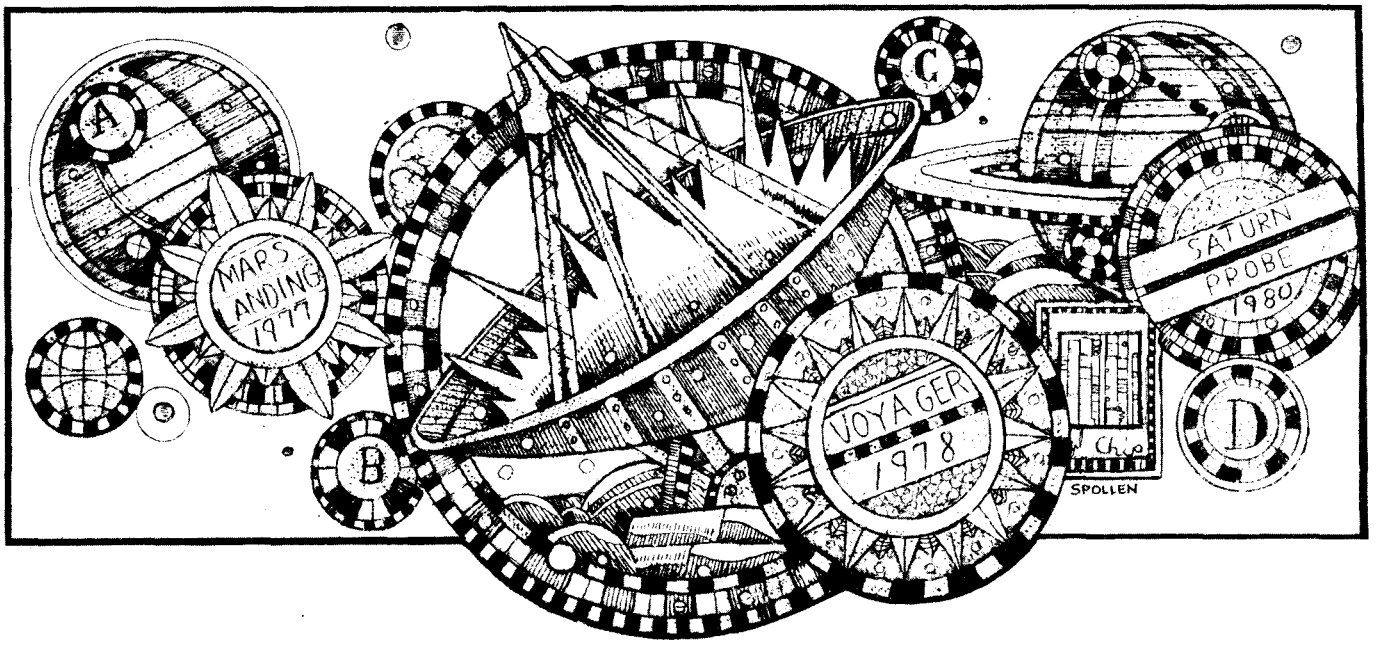

unconnected entities. Guided by the theory, we came to see more meaning in energy aspects of research in subatomic particles, and in the end, the nuclear bomb was invented and nuclear-power stations were made possible.

Einstein worked outside the field of relativity, too. In 1917, he pointed out that if a molecule is at a high-energy level (a concept made possible by the purely scientific quantum theory, which had its origin in 1900) and if it is struck by a photon (a unit of radiation energy) of just the proper frequency, the molecule drops to lower energy. It does this because it gives up some of its energy in the form of a photon of the precise frequency and moving in the precise direction as the original photon.

Thirty-six years later, in 1953, Charles Hard Townes made use of Einstein's theoretical reasoning to invent the "maser" that could amplify a short-wave radio ("microwave") beam of photons into a much stronger beam. In 1960, Theodore Harold Maiman extended the principle to the still shorter-wave photons of visible light and devised the first "laser." The laser has infinite applications, from eye surgery to possible use as a war weapon.

And Edison?

The net result of his inventions was to spread the use of electricity the world over; to increase greatly the facilities for the generation and transmission of electricity; to make more important any device that would make that generation and transmission more efficient and economical. In short, Edison made the pure-science study of the flow and behavior of the electric current an important field of study.

Charles Proteus Steinmetz was certainly a technologist. He worked for General Electric and had two hundred patents in his name. Yet he also worked out, in complete mathematical detail, the intricacies of alternating-current circuitry, a towering achievement in pure science. Similar work was done by Oliver Heaviside.

As for Edison himself, his own work on the electric light unwittingly led him in the direction of purity. After he had developed the electric light, he labored for years to improve its efficiency and, in particular, to make the glowing filament last longer before breaking. As was usual for him, he tried everything he could think of. One of his hit-and-miss efforts was to seal a metal wire into the evacuated electric light bulb near, but not touching, the filament. The two were separated by a small gap of vacuum.

Edison then turned on the electric current to see if the presence of the metal wire would somehow preserve the life of the glowing filament. It didn't, and Edison abandoned the approach. However, he noticed that an electric current flowed from the filament to the wire across that vacuum gap. Nothing in Edison's vast practical knowledge of electricity explained this flow of current, but he observed it, wrote it up in his notebooks, and patented it. The phenomenon was called the "Edison effect," and it was Edison's only discovery in pure science—but it arose directly out of his technology.

Did this seemingly casual observation lead to anything? Well, it indicated that an electric current has, associated with it, a flow of matter of a particularly subtle sort—matter that was eventually shown to be electrons, the first subatomic particles to be recognized. Once this was discovered, methods were found to modify and amplify the electron flow in vacuum and, in this way, to control the behavior of an electric current with far greater delicacy than the flipping of switches could. Out of the Edison effect came the huge field of electronics.

THERE ARE OTHER examples. A technological search for methods to eliminate static in radiotelephony served as the basis for the development of radio astronomy and the discovery of such phenomena as quasars, pulsars, and the big bang.

The technological development of the transistor brought on an improved way of manipulating and controlling electric currents, and has led to the computerization and automation of society. Computers have become essential tools in both technology and science. A computer was even necessary for the solution of one of the most famous problems in pure mathematics—the four-color problem.

The technological development of a liquid-fuel rocket has led to something as purely astronomical as the mapping, in detail, of Mars and of experiments with its soil.

The fact is that science and technology are one.

Just as there is only one species of human being on earth, and all divisions into races, cultures, and nations are but man-made ways of obscuring that fundamental truth, so there is only one scientific endeavor on earth—the pursuit of knowledge and understanding—and all divisions into disciplines and levels of purity are but man-made ways of obscuring *that* fundamental truth.◉

Isaac Asimov's 200th book, In Memory Yet Green: The Autobiography of Isaac Asimov, *has just been published.*

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A report from The Edison Electric Institute

SYMPOSIUM

A Special 16-Page Overview

The electric car: will there be one in your garage?

The [illegible]

Safety factors.

A gallery of current EVs.

Plus ecological and technological test results.

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The electric car: 100 years in the making.

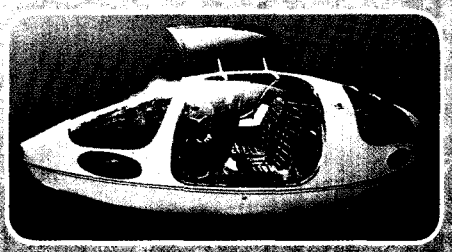
The first road vehicles that traveled by themselves were introduced in the latter part of the 18th century. They were steam-powered, difficult to start and even more difficult to operate. Still, by the mid-1800s, more than 100 American companies were producing steam cars. At the same time, a number of inventors in both Europe and America were exploring a more promising power source: electricity. Frenchman Gaston Plante's development of the storage battery in 1859-'60 made the electric car feasible, and in 1890 William Morrison introduced the first American battery-powered automobile, which was capable of a speed of 14 mph. By the turn of the century, 38 per cent of American cars were powered by electricity. By 1912, the peak year of acceptance, some 30,000 electric cars manufactured by 20 companies were on the road—all of them with an inherent limitation that has persisted to the present: the EVs' restricted range due to the need to recharge the battery.

In search of a better propulsion system, inventors soon turned to the internal combustion engine. In the ensuing years, ICE vehicles overshadowed EVs. Nonetheless, EVs continued to evolve throughout the gas-powered auto era, the electric golf cart and fork lift truck being notable examples of mass application of electric propulsion.

The energy crisis has spurred new EV efforts by both governmental and private groups throughout the world. In 1973, the Electric Vehicle Council, New York, and the International Union of Producers and Distributors of Electrical Energy, Paris, began sponsoring an annual International Electric Vehicle Symposium to review the state of progress of electric vehicle technology and to exchange experience and information on the different factors that influence its development.

The following articles are drawn from papers presented at the Fifth International Electric Vehicle Symposium held in Philadelphia in October, 1978, and represent solely the views of the distinguished international participants. The Edison Electric Institute is making the material available in this form because it is dedicated to offering concerned citizens impartial information on the various issues and technological developments affecting the nation's electricity needs, usage and delivery systems.

Readers interested in obtaining further information on any aspect of electric vehicle development are invited to write or call The Edison Electric Institute, 90 Park Avenue, New York, N.Y. 10016, (212) 573-8700. After June 1979, EEI will be in new consolidated offices at 1111 19th Street, Washington, DC 20036●



Cover Car. The egg-shaped fiberglass Yanes manufactured by TE Laboratories, Inc., P.O. Box [illegible], Lafayette, Indiana 47903.

Symposium is edited by Rees Behrendt and designed by George Kurten.

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Uncle Sam in the driver's seat.

THE UNITED STATES ELECTRIC AND HYBRID VEHICLE PROGRAM IS UNDER WAY. HERE'S WHERE IT STANDS TODAY.

by P.J. Brown, Department of Energy, USA

In September 1976, the United States Congress enacted Public Law 94-413, The Electric and Hybrid Vehicle Research, Development and Demonstration Act of 1976. Congress states in the act that it is clear that the nation's dependence on foreign sources of petroleum must be reduced. Since transportation is the single largest use of petroleum supplies, the introduction of significant numbers of electric and hybrid vehicles into the transportation fleet would reduce the use and dependence on petroleum.

To implement the provisions of the act, the Department of Energy has established an Electric and Hybrid Vehicle Program that has three main thrusts. First, to foster and support research development testing and evaluation of electric and hybrid vehicles systems and their component technology to improve the performance of vehicles on the road. Second, to assess the economic and technical practicability of electric vehicles by undertaking a broadly based, federally supported vehicle demonstration. Finally, to enhance the infant electric and hybrid industry by assisting in financing the commercial production of competitive vehicles.

Congress demonstrated its continued interest in the EHV program with the enactment of Public Law 95-238, The Department of Energy Act of 1978—Civilian Applications. In the provisions of Title VI of this Act, amendments to the original Public Law 94-413 were incorporated to improve the overall program. One of the major amendments concerns the schedule for the acquisition of demonstration vehicles and also increasing the total number of demonstration vehicles from 7,500 to 10,000. It was felt by members of Congress and the DOE that the premature demonstration of current technology would not permit proper response to market and technology developments. The law was therefore amended to allow flexibility in the timing and in the quantities to be procured.

RESEARCH, DEVELOPMENT, TESTING AND EVALUATION

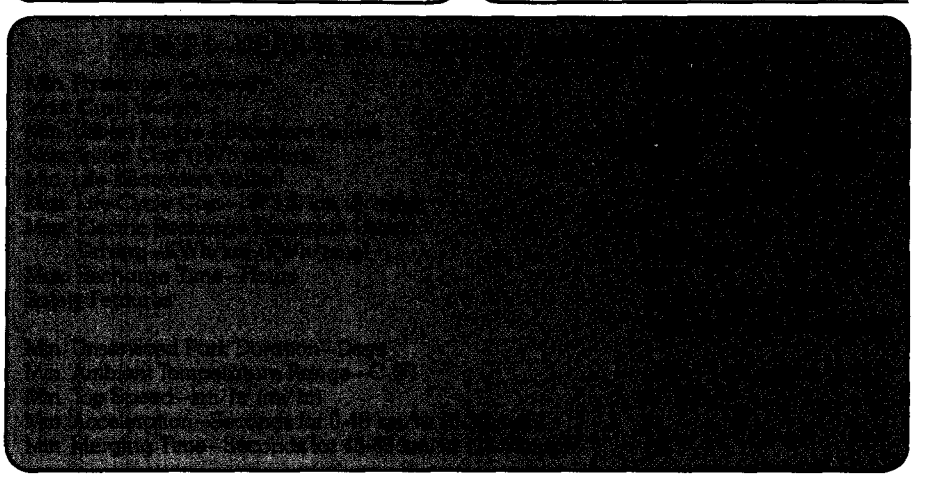
In order to advance the technology of electric and hybrid vehicles, the Department of Energy is conducting an intensive research development, testing and evaluation program. (A summary of DOE's state-of-the-art assessment accompanies this article.)

Two different near-term electric vehicle designs are being developed, and integrated test vehicles are being fabricated by the General Electric Company and the Garrett Corporation. These vehicles are scheduled for completion and to be ready for test by May 1979. Some of the performance objectives of the two designs are displayed in Table I for the near-term electric vehicle.

The DOE is also conducting a program for the development of near-term hybrid vehicles. NASA's Jet Propulsion Laboratory has been selected by DOE to procure and manage the contracts for the hybrid vehicle program.

In addition to total vehicle design developments, a major effort in battery development for electric and hybrid vehicles is being carried out. Three battery systems have been identified as candidates for R&D effort leading to improvement in the near term: (1) nickel/iron (2) nickel/zinc and (3) lead/acid.

The Argonne National Laboratory (ANL) is the program manager for DOE, and eight subcontractors have been selected for the development efforts: lead/acid—Globe Union, ESB and Eltra; nickel/zinc—Yardney, ERC and Gould; nickel/iron—Westinghouse and Eagle Picher. These American battery companies are also working with a number of foreign battery companies. Each contract culminates with the delivery in 1980



Some significant breakthroughs have occurred in these projects, such as the lightweight flywheel design by Garrett and the transistor modules by General Electric.

and 1981 of up to 15 full size EV batteries from pilot development lines. A National Battery Test Laboratory is operational at ANL to evaluate, verify and make test comparisons of cells, modules and

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batteries under uniformly applied test conditions.

For the DOE program, NASA's Lewis Research Centers are negotiating contracts covering improved and advanced EHV propulsion systen component technology. These improved technology contracts cover: (1) a.c. motor controllers, (2) mechanically commutated d.c. motors, (3) electronically commutated d.c. motors and (4) energy buffer for regenerative braking. Advanced d.c. motor controllers and electric motor development contracts are also being negotiated.

DEMONSTRATIONS

In compliance with Public Law 94-413, the DOE issued performance standards on May 30, 1978, for the first demonstration vehicle acquisition. A summary of the standards for personal use and commercial vehicles is given in Table II.

public utilities or delivery services, or marketing and service operators, who will sell or lease to individuals or small companies. In addition to the private sector site operators, federal, state and local government fleets will participate in the demonstration program. Over 50 cities have indicated an interest in the program.

After the demonstration operators have purchased their vehicles from the manufacturers, the operational phase of the project will begin, and data will be kept on the functioning of the vehicles.

INCENTIVES

Congress incorporated provisions for incentives (such as Loan Guaranties) in Public Law 94-413 to encourage private sector involvement in the program. Under its provisions, private loans up to $3 million per project may be guaranteed by the federal government. A ceiling of $60 million has been set

TABLE II SUMMARY–PERFORMANCE STANDARDS ELECTRIC AND HYBRID VEHICLES

Parameter	Conditions	Personal Use (Note 1)	Commercial (Note 1)
Acceleration	0-50 km/h	15 sec.	15 sec.
Gradeability	@ 25 km/k	10%	10%
Gradeability Limit	for 20 sec.	20%	20%
Forward Speed	for 5 min.	80 km/h	70 km/h
Range (SAE 227a)	EV	50 km–C cycle	50 km–B cycle
	HV	200 km–C cycle	200 kkm–B cycle
Energy Consumption	EV	*	*
	Hv (Note 2)	1.3 MJ/km (non-elec)	9.8 kj/km.kg (non-elec)
Battery Recharge Time	from 80% discharge (110 or 220 vac)	10 hours	
Safety		NHTSA Stds. * + others	
Emissions		FED. Stds.	
Recharge Control		YES	
State-of-Charge Meter		YES	
Odometer		YES	
Heater		Available as Option	
Documentation		YES	

Notes: 1) SAE J227a Test Procedures apply
2) Non-Electrical Consumption must be 75% of total energy consumed
3) Refer to official publication of standards

To implement the EHV Demonstration Project, the Department of Energy will utilize local demonstration site operators who will provide the requisite maintenance and parts supply support as well as furnishing operator or market demonstration vehicles.

The private sector groups will be either fleet operators, such as

for the aggregate amount of guaranties outstanding at any one time. Public Law 95-238 also amended the Loan Guaranties section of the original act by establishing an Electric and Hybrid Vehicle Development Fund in the Treasury of the United States.

Another incentive for small business is the availability of planning grants for firms who lack the funds necessary to prepare and submit proposals.

In addition to the financial incentives, Congress authorized the conduct of studies and research programs on incentives that will encourage greater use of electric and hybrid vehicles. A number of studies have been initiated identifying barriers to the use of EHVs and suggesting corrective incentives.

STUDIES

Section 13 of Public Law 94-413 states that four specific areas are to be studied:

(1) *Institutional Factors* that may bias the transportation system towards vehicles of particular characteristics. A study was conducted by the Transportation Systems Center of the U.S. Department of Transportation, in August, 1977. A continuing effort is being made by TSC to suggest alternative ways of overcoming the barriers of EHV.

(2) *Long-Range Material Demands and Pollution Effects* stemming from the use of electric and hybrid vehicles. This study was completed by General Research Corporation on August 11, 1977.

(3) *Safety Standards and Regulations* for electric and hybrid vehicles are recommended to DOE by the National Highway Traffic Safety Administration of the U.S. Department of Transportation.

(4) *Regenerative Braking* system effectiveness and feasibility for electric automobiles. This study is being conducted for DOE by The Lawrence Livermore Laboratory.

In addition, DOE is working cooperatively with the U.S. Department of Agriculture to determine the agricultural uses of electric vehicles.

The ultimate goal of the federal program is to assist in the commercialization of a viable and competitive electric vehicle industry. With an industry capable of producing electric and hybrid vehicles for personal use and commercial vans at competitive life cycle costs, it is possible that as many as 10 million electric and hybrid vehicles will be part of the transportation fleet in the year 2000. This will result in an annual saving of 100 million barrels of oil a year●

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State-of-the-Art Assessment Update

W.J. *Dippold, of the Department of Energy, summarizes the results of 1978 electric vehicle state-of-the-art assessment reports:*

It is clear from the data of the various reports that vehicles with current technology in batteries, controllers and motors provide more energy efficiency with four-speed manual transmissions than vehicles without transmissions or those using automatic transmissions. The data show this to be true of both personal and commercial vehicles.

Because of the large variation in motor characteristics, particularly torque, it is difficult to assess the value of a transmission on time to accelerate to moderate speeds. The analysis is equally difficult on gradeability at low speeds above 5 kilometers per hour. The original SOAA report shows that the gradeability limit at two to three kilometers per hour of a current SOA vehicle is measurably improved by a four-speed manual transmission. Without a transmission, it is clearly observable during testing that the battery current demand on starting is much higher. This is particularly true of vehicles that are geared to have top speeds greater than 70 kilometers per hour and that are not equipped with a maximum current limit controller. The data show the gradeability of vehicles with four-speed transmissions to be better than the gradeability of vehicles without transmissions at vehicle speeds of 50 kilometers per hour and greater.

While these few vehicles provide insufficient data to draw firm conclusions either presently or long-term, the data do indicate that there are some distinct advantages to a four-speed transmission in current technology electric vehicles. The effects on energy efficiency (range improvement), reduction of power demands on the battery at start-up and improvements in gradeability at moving traffic speeds would appear to offset the inconvenience of having to shift while driving. Opportunities are clearly visible for improvements in controller-motor designs to limit the power demands on the battery for routine start-up of a vehicle without a transmission and to improve the torque characteristics (i.e., gradeability) at the higher speed end. Alternatively, transmission design opportunities continue to be visible with the objective of maintaining the apparent advantages of the four-speed transmission but requiring no overt action on the part of the driver to change gears●

From the paper: Electric Vehicle State-of-the-Art Assessment Update.

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The smog fighters are coming.

AN L.A. STUDY SHOWS EVS WOULD SHARPLY REDUCE TODAY'S ICE AIR POLLUTION.

—by D.L. Harbaugh, Southern California Edison Co., USA

The air pollution of an electric vehicle can be compared to that of a gasoline vehicle in two ways:

(1) total pollutants emitted into the atmosphere due to operation of each type vehicle on a per mile basis; and

(2) the effect of these emissions in terms of ground level concentration.

The emitted pollutants include not only those from the vehicle but also emission from the power plant (to generate the electricity required to charge the EV battery) and the oil refinery (for manufacture of both the gasoline and power plant fuel oil). The emissions for the electric vehicle are calculated based on an oil-fired generating plant because:

(1) these plants generate the majority of Southern California Edison power in the Los Angeles area; and

(2) it simplifies the problem of power and pollutants mix analysis (i.e., from hydro, nuclear, etc.).

The time frame used for this analysis was 1980 because:

(1) it is sufficiently near-term to use current SCE data; and

(2) a number of the references from which data have been extracted have used 1980 as the study year.

SCE agrees with the original ERDA estimate for EV energy consumption of 0.8 kwhrs/mile, and this estimate has been used to calculate the total pollutants per mile in the pollution table. This table is a "worst case" example, and it still indicates that, except for SO2, the electric vehicle will be clearly superior to the gasoline vehicle in terms of emitted pollutants.

In addition, the following factors should also be considered in the comparison:

(1) To the extent that further emission reductions are required and can be made practicable at generating stations, it will further reduce emission levels. While installation and maintenance of control systems at refineries and power plants require a substantial investment, this may ultimately be a more practical solution than the installation and maintenance of millions of miniaturized control systems on the automobile population or disruptive traffic control measures.

(2) In practice, the effectiveness of existing automobile pollution control systems has been shown to deteriorate because of age and inadequate maintenance. In contrast, power plant emission controls are continuously maintained.

(3) Most importantly, because the pollutants are removed from the sites of concentrated local pollution (i.e., downtown freeways) and are instead expelled from high smokestacks, the contribution to the breathable ground level pollution is sharply reduced, in most cases by over 99 per cent.

Further, in populated areas that are located directly adjacent to power plant exhaust stacks, pollutant levels within the ground plane of the emission plume should contribute but a small fraction of the concentations that define air quality standards to protect health and welfare, even under adverse conditions.

The end effect of electric vehicle use in the Los Angeles Basin will be to reduce the air pollution caused by automobile travel, because:

(1) Electric vehicles introduce significantly less total and individual pollutants on a per mile basis than gasoline-powered vehicles (except for SO2 emissions, which are only slightly greater on a per mile basis in the worst-case analysis). It should also significantly reduce formation of oxidant, a secondary pollutant.

(2) To the extent that power plant emission reductions are required, and can practicably be made, the comparison is even more favorable for the EV.

(3) To the extent that battery-charging energy is supplied by nuclear hydroelectric and out-of-state coal-fired plants, the comparison is also more favorable for EVs.

(4) Electric vehicles will reduce the automobile contribution to ground-level pollutant concentrations by over 90 per cent, because the EV emission source will be from elevated power plant exhaust stacks.

(5) Shifting the automobile emissions point from the individual tail pipe to a power plant stack offers continual, superior opportunities for control of automotive air pollution emissions●

TOTAL POLLUTION CONTRIBUTION

Electric Veh.	HC	CO	NO2	SO2	Part
Vehicle	0	0	0	0	0
Power Plant (a)	.128	.024	.696	.752	.080
Refinery (b)	.007	.002	.061	.198	.010
Total (c)	.136	.026	.757	.950	.090
Gasoline Veh.					
Vehicle	41(d)	9.00(d)	1.50(d)	0.13(f)	0.12(g)
Power Plant	0	0	0	0	0
Refinery (e)	.99	0.01	0.40	0.71	0.10
Total (c)	1.40	9.01	1.90	.84	0.22

From the paper: A Comparison of the Overall Air Pollution Contributions of Electric and Gasoline-Powered Vehicles in the Los Angeles Area.

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Making the electric car safe.

CONVENTIONAL CARS HAVE HAD 80 YEARS TO OVERCOME THEIR HAZARDS. TO COMPETE, EVS MUST ENGINEER IN SAFETY FROM THE START.

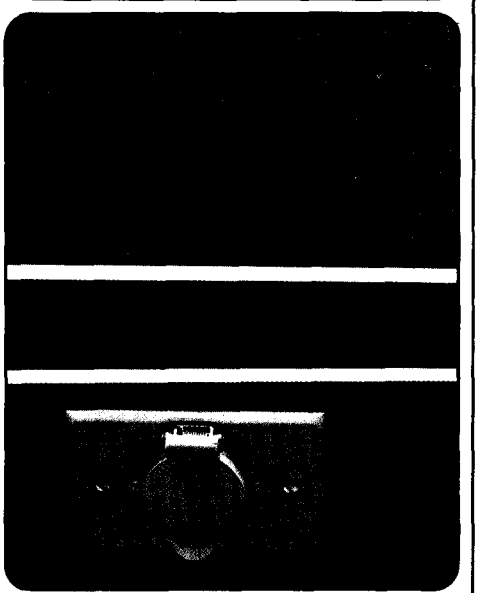
by G. G. Harding, Lucas Batteries Ltd., United Kingdom

As the development of battery electric vehicles with good road performance leads to greater numbers of such vehicles being operated alongside their conventional counterparts, unless EVs are seen to be at least as safe as ordinary cars, their further adoption could be impeded by the attitudes of potential operators and/or legislators.

Because battery-powered vehicles with high performance have only been introduced within the last decade, equal safety standards will need to be achieved in a very short time in comparison with conventional vehicles, which have had 80 years to achieve present levels of safety. To this end, members of the Lucas electric vehicle development team and others associated with them have given serious attention to safety aspects of EV designs.

The Lucas electric vehicle program has now run for over 10 years, and during this time the 65 vehicles that have been built have accumulated over a quarter of a million miles under operational conditions, using lightweight lead-acid batteries. Throughout this development period, it proved very difficult indeed to forecast some of the safety problems, even those that, subsequent to their discovery, appear to have been impossible to overlook. An example of this was the first battery explosion in a Lucas vehicle. The effect of explosions in single cells is well known and produces little damage, but an explosion due to ignition of an explosive gas mixture that has accumulated in the space above the battery as well as in the cells is a very different phenomenon. This occurred during a Sunday night in the very hot summer of 1976 due to an overcharging situation in a garage which had not been approved by Lucas.

The explosion very nearly demolished the vehicle. As a safeguard against another similar incident, all Lucas vehicles were withdrawn from service, and a thorough investigation was begun to determine the factors leading to various situations where explosions can occur and all possible means of averting such conditions.



We examined such factors as the speed of gas dispersion under various conditions and the rate at which gas is generated when regenerative braking is used with a battery near the fully charged state. Tests clearly pointed to the need for very thorough ventilation of the battery compartment. It was therefore necessary to build a charger and associated venting system to meet strict requirements in addition to the current/time schedule for charging in the minimum time with minimum overcharge.

In order to prevent a propagated explosion, as opposed to single cell explosions, the gaseous mixture in the battery compartment must be kept below the lower explosive limit (L.E.L.) under all operating conditions. The L.E.L. for hydrogen in air is 4% by volume, but it is understood that, once initiated, an explosion can be propagated at levels considerably below this, and Lucas is aiming for a hydrogen level within the battery compartment of one-quarter of the L.E.L. to prevent propagation from one cell to another. To ensure that this limit is not exceeded the system must be designed so that the charger limits the gassing current to a pre-set level, and the battery compartment is adequately ventilated.

Natural ventilation of the battery compartment of the latest Lucas vehicles in service has been maximized by leaving the battery compartment open around the top. The interconnections between individual battery units are sealed to protect them from the effects of moisture and dirt. However, with the battery suspended only a very short distance below the vehicle floor, it has been found that such a system still requires some forced ventilation over the tops of the batteries during charging, and this is achieved by tangential a.c. mains fans.

An explosion can only occur, of course, if there is both an explosive mixture and a suitable ignition source, which may be as small as a low voltage spark. It is therefore essential that the positioning of contactors, d.c. motors or any other spark-producing equipment in or near the battery compartment should be avoided.

HANDLING BATTERY PACKS

In our present van models, the battery is contained in a pannier, which is positioned under the floor of the vehicle. In addition to facilitating the removal and replacement of the battery, by lowering and raising it vertically, such an arrangement has the advan-

From the paper: Some Aspects of Electric Vehicle Safety

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tage that the body of the vehicle can be completely sealed from the battery compartment.

The battery pannier, in addition to supporting the weight of the battery, must also protect it from road debris which may be thrown up by the wheels. In addition, an air space is provided around the battery units to avoid overheating during prolonged heavy charge or discharge periods. The use of stainless steel (AISI Type 316) provides the required strength and impact resistance to withstand road usage and also overcomes corrosion problems associated with accidental acid spillage. Panniers made from GRP, using fire retardant resins and metal reinforcement as necessary, and from other plastics, are being investigated, since they offer the additional built-in safety feature of electrical insulation.

SAFE WORKING WITH HIGH VOLTAGE

High performance electric vehicles, by definition, require motors, controllers and batteries that can deliver relatively high levels of power. Mainly for reasons of cost, it is necessary to keep currents as low as possible, and therefore higher system voltages are likely to be required than have generally been used hitherto on battery vehicles. The present Lucas 1-ton payload delivery vehicles use 50 hp (37 kW) traction motors with a nominal system voltage of 216 V. This comparatively high d.c. voltage clearly needs to be treated with respect, and thorough precautions need to be taken to protect personnel from electric shock, whether they are using the vehicle, servicing it or attending to the batteries.

In order to minimize the danger of electric shocks on the vehicle itself, and at the same time reduce the chances of accidental short circuits through insulation failure, the high voltage power system is designed to be totally isolated electrically from the vehicle body, so that accidental contact with a "live" potential will not complete a circuit to earth.

The main battery connections are linked to the controller via double pole isolating contactors, which are normally in the open position except when the controller is switched on.

The ability to remove the battery complete in its pannier also enables the high voltage connections to the vehicle to be broken automatically by means of a plug and socket without the need for any manual removal of connecting leads within the vehicle.

ELECTRONIC CONTROL SYSTEMS

In an electric vehicle incorporating a thyristor as its main current control element, the motor power is controlled by rapid switching of the motor current by a solid state device. This provides very smooth control of the traction motor and also enables the full performance of the vehicle to be maintained until the battery is almost fully discharged.

In the event of a malfunction, however, the current switch can remain in the "on" position, so that the driver loses control of the motor current. With a series motor, by its very nature this means a high fault torque or motor power, until interrupted by the system fuse. Normally this takes place almost instantaneously, and there is no danger to the vehicle occupants or bystanders, but in certain circumstances the fuse may take some time to blow, resulting in a temporary effect somewhat similar to a throttle sticking on an ICE vehicle. All our latest vehicles are fitted with a cut-out button, designed to enable a driver to isolate the battery from the drive system in an emergency.

FUSES AND CIRCUIT BREAKERS

Fuses are essentially non-ideal circuit elements, taking a finite time to blow, depending on the degree of overload. In a series system, at high vehicle speeds, the fault current is limited by the series motor characteristic, and blowing times can be relatively long. The rating of fuse necessary to protect the vehicle against the consequences of control failure may be lower than that which would otherwise be chosen for the application, leading to a somewhat reduced life. It has also been established that even if a fuse is operated within its rating, the combination of vibration and thermal cycling experienced in the normal duty cycle of a vehicle will eventually cause the failure of a present generation semiconductor fuse through mechanical fatigue of the fuse elements. Because of these shortcomings, we are investigating the possiblity of using a magnetic circuit breaker as the primary circuit protection element.

REGENERATIVE BRAKING

Regenerative braking is fitted to Lucas vehicles for three main reasons: first, to reduce wear of the normal friction braking system, thereby reducing down time and maintenance costs; second, to reduce the extent to which a vehicle's battery is discharged by any given duty cycle, since this may increase battery life; and third, to improve the feel or "driveability" of the vehicle.

The design of the regenerative braking system is such that the first element of regenerative braking comes into operation when the accelerator pedal is released. This roughly equates to "engine braking" in an ICE vehicle. The first movement of the brake pedal brings into operation a higher level of regenerative braking, which at its maximum gives rise to a retardation of the order of 20%g. On the latest vehicles, provided the brake pedal remains depressed, regenerative braking remains in operation until the vehicle is virtually at rest.

From time to time it has been suggested that relatively high levels of regenerative braking can only be applied with safety to front-wheel-drive vehicles, and that on ice-covered roads regenerative braking of the level used on Lucas vehicles applied to the rear wheels only might induce dangerous wheel skids. International braking regulations also specify that the service braking action should be on all wheels and that an increasing pedal movement should be accompanied by an increase in vehicle retardation, and vice versa. The particular features of regenerative braking may not be entirely compatible with these regulatory requirements and may necessitate further discussion.

Lucas has conducted a number of tests in an endeavor to establish whether rear wheel skids

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can be induced under adverse conditions by regenerative braking. Although it is not claimed that such testing has been exhaustive, so far it has not been possible to induce rear wheel skids by this means.

PARKING BRAKES

Unlike ICE vehicles, electric vehicles of the type not fitted with an automatic gearbox have no means other than the parking brake for locking the wheels when parked. In hilly terrains, some operators of Lucas vehicles have requested an additional means of locking the wheels. This is because parking brake ratchets are known to fail from time to time. It is desirable to be able to meet this requirement, and we are currently working on alternative solutions.

WATER WADE TESTS

Lucas does not intend ever to be a company that manufactures vehicles. In order to ensure that the complete vehicle into which the Lucas drive system is fitted is completely satisfactory, it is necessary for it to be developed and tested by its manufacturer. Lucas considers itself very fortunate to be working closely with GM's UK subsidiary, Vauxhall Motors, and sharing a joint development program with them. In addition to performance and handling, the program has included shallow water wade tests, which initially showed that water entered the control system housing, the motor, the main battery connection and the battery compartment itself. Gradually these problems have been overcome, and it is now possible to drive vehicles at 25 mph (40kph) in water 4 inches (100mm) deep without problems even under these very severe conditions.

SILENCE

One of the attributes of electric vehicles frequently alleged by many people to be both an environmental advantage and at the same time also a hazard is their relative silence. It is often suggested that, being silent, they must present additional danger to pedestrians, particularly to old people.

So far we have not experienced this problem in service and believe that this may be partly due to the fact that in cities most vehicles are preceded by a vehicle and also followed by another. It is almost impossible to stand on the sidewalk and pick out which of the three fairly closely spaced vehicles is the quiet electric. The relative silence of the many thousands of electric milk delivery vehicles operating in the UK is not known to have caused any significant safety problems.

HEATING

It is now almost universally accepted that the most appropriate means of heating an electric vehicle is by one of the several types of proprietary combustion heaters currently available. These are manufactured as either air-or-water-heaters, and alternative types will operate on gasoline, kerosene or bottled gas. Kerosene for heating is safer under crash conditions than gasoline, and to add to the safety, the fuel tank is filled with aluminum mesh and is positioned in a relatively safe situation behind the front axle beam.

DRIVER CONTROLS

A feature included on every Lucas vehicle has been the automatic selection of a "no-drive" situation if the equivalent of the ignition key is turned to the "off" position. This is to ensure that when the driver switches on again movement of the accelerator pedal will not cause the vehicle to move at all, let alone in an unexpected direction. In order to move the vehicle at all after turning the key, the driver must make a positive selection of the direction in which he wishes to move before the accelerator becomes operative. In addition, Lucas vehicles incorporate a speed limiting device whenever reverse is selected, but the device does not limit the torque available.

Lucas believes that there should be free exchange of information on all aspects of safety among companies involved in electric vehicle development, to ensure that these vehicles become as safe as possible as soon as possible●

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The shape of the future.

THREE PLUG-IN PROTOTYPES FROM SOME 100 SHOWN AT THE FIFTH INTERNATIONAL ELECTRIC VEHICLE SYMPOSIUM.

The Centennial Electric

General Electric Research and Development Center
P.O. Box 8, Schenectady, N.Y. 12301

Named in honor of General Electric's 100th birthday, this four-passenger, front-wheel drive subcompact was designed to achieve top performance from off-the-shelf components and commercially available battery systems. It was built to GE specifications by Triad Services, Inc., of Dearborn, Michigan, and is powered by 18 six-volt, lead-acid batteries from Globe-Union, Inc.

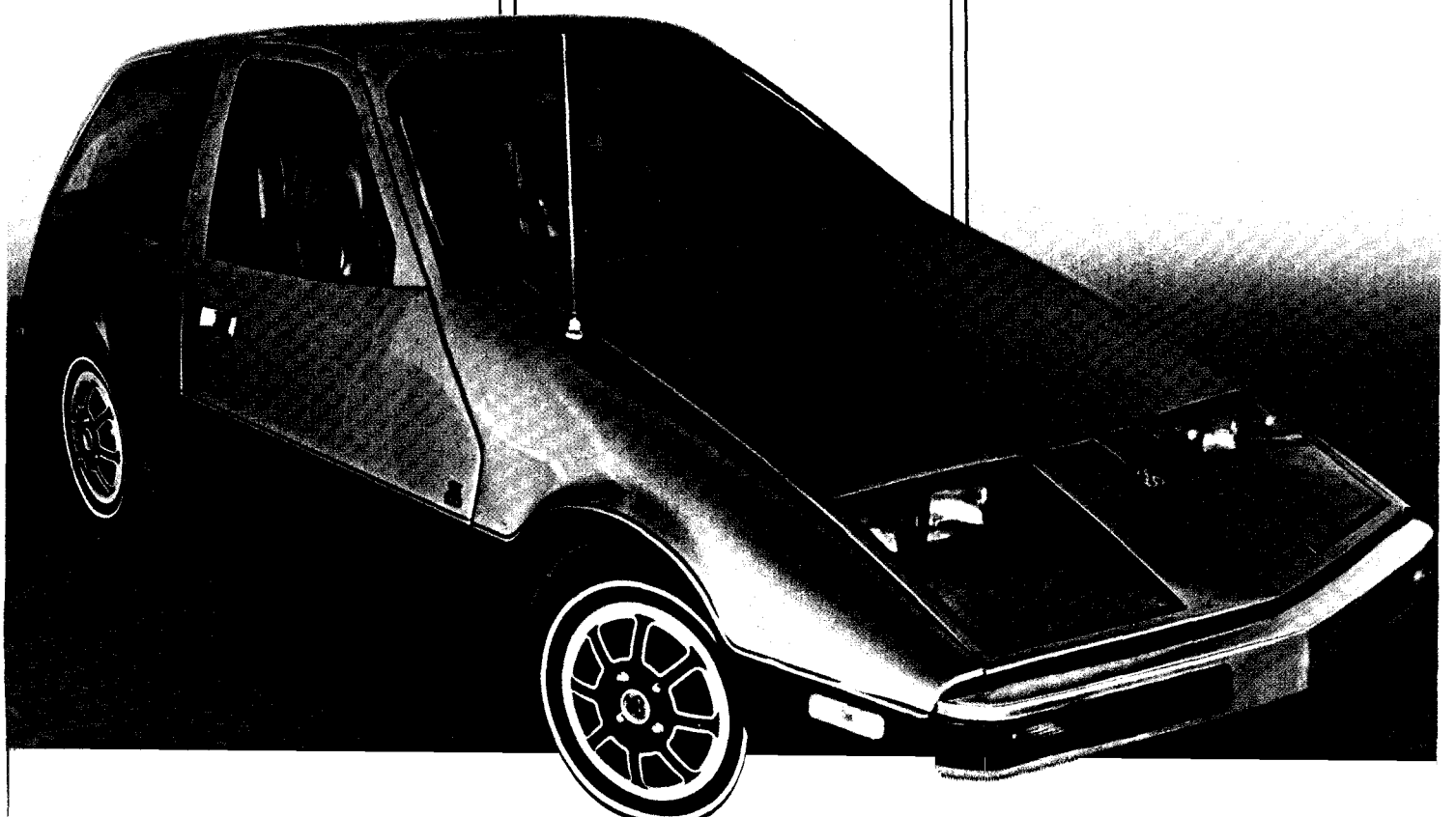
The vehicle has a range of 75 miles at a constant 40 miles per hour, a cruising speed of 55 mph and a passing speed of up to 60 mph. In stop-and-go urban driving, its range is about 45 miles between charges. It can accelerate from zero to 30 mph in nine seconds.

The Centennial Electric weighs 3,250 pounds, including batteries. It stands 53.3 inches high, is 160 inches long, 66.1 inches wide and has a wheelbase of 92 inches. Ground clearance is six inches. It has a low center-of-gravity, because 1,225 pounds of batteries are slung on a movable trolley beneath the vehicle and run nearly its full length. It has no grill, because there is no radiator to cool.

To keep the car low to reduce air drag, as well as to permit easier entry and exiting, the back seats face to the rear and are entered through a hatchback-type rear door. Because the front doors open out and forward on hinged links, they can be opened fully even when the car is parked within 14 inches of an obstacle.

Auxiliary equipment includes a gasoline-type heater, AM/FM/CB radio and electric windshield wipers and defrosters. Fans, headlights and other accessories operate off a standard 12-volt battery, which is connected to an on-board battery charger.

Although the car is not for sale, it was designed to sell for about $6,000 if 100,000 vehicles were manufactured annually in one plant●



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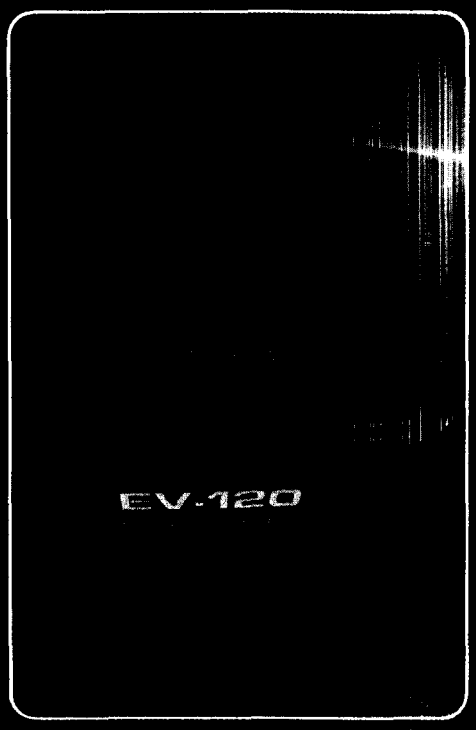
Globe-Union, Inc.
5757 Green Bay Avenue,
P.O. Box 591
Milwaukee, Wis. 53201



This four-passenger test car, designed by the world's largest manufacturer of automotive replacement batteries, had its preliminary performance testing during a harsh Milwaukee winter. After an overnight charge, the Endura was driven on suburban streets at city speeds of 30-35 mph for over 100 miles. It also reached speeds in excess of 60 mph under expressway conditions.

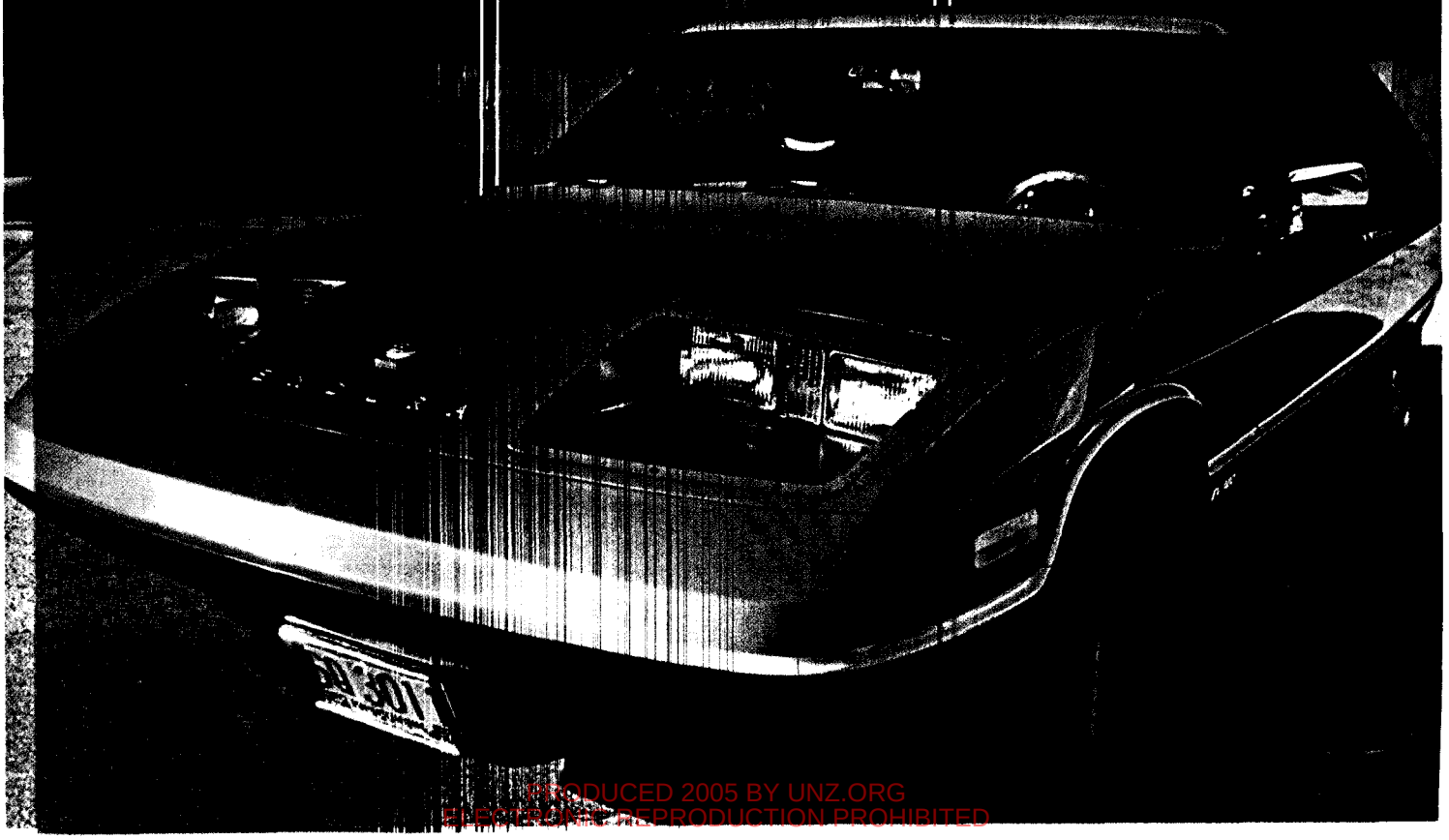
The Endura's power source consists of twenty 12-volt, lead-acid Globe-Union electric vehicle batteries mounted on an aluminum frame and roller sub-assembly tray, with access through the front bumper section.

The rear-wheel drive system is powered by a 20 horsepower, 120-volt series wound motor, 0-5000 rpm with 100 cfm forced air cooling. The motor is integrally mounted to a planetary transmission, transaxle and differential arrangement. Total gear ratio reduction 4.93:1.

The body is lightweight fiberglass with integral steel roll cage laminated to the interior for strength. A small spoiler on the undercarriage, plexiglass-covered rectangular headlights, recessed wipers and flush-mounted windshield reduce air flow resistance.

The frame is aluminum alloy for maximum weight savings and corrosion resistance. There is independent front and rear suspension.

Specifications: wheelbase, 108 inches; track front, 60 inches, rear, 58.8 inches; length, 184 inches; width, 72 inches; battery weight, 1,300 lbs; total weight, 3,200 lbs●



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Copper Electric Town Car

Copper Development
Association Inc.
405 Lexington Avenue
New York, N.Y. 10017

CDA, the copper and brass industry's advanced market development arm, first introduced its Town Car in 1975. This current model, built by Triad Services to CDA specifications, is the fourth in a series of prototypes, with each representing a technological advance over the previous vehicle.

This advanced Town Car has a range of 120 miles at a cruising speed of 40 mph and a top speed in excess of 55 mph. The hatch-back two-seater weighs 2,972 lbs., including the approximately 1,200 lbs. of its 18 six-volt, lead-acid batteries. The unitized body is constructed of sheet steel external panels with welded box structures and other shapes for reinforcement in keeping with the design requirement that it be adaptable to mass production.

The Copper Electric Town Car has a front wheel drive system, utilizing a specially wound, separately excited electric motor with a matched field control system. It also features regenerative braking, which has resulted in improved range.

Because the doors swing outward far enough to clear the car's body, then travel rearward parallel to the body, easy entry and exiting is possible with just 11 inches of clearance available●

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Test drives

AROUND THE WORLD, PILOT PROJECTS ARE ASSESSING ELECTRIC VEHICLES. HEREWITH, THREE EXAMPLES.

1. POST OFFICE DELIVERY VANS IN CALIFORNIA

by B. W. Burrows, W. J. Wysor and R. J. Hartman, Gould Inc., USA

The largest electric fleet operation in the U.S. today is that of the U.S. Postal Service. In 1975-76, 362 electric vans having a unique propulsion system were completed and delivered. The vehicles are now in service throughout the United States, with the greatest concentration in California. These electric vans, manufactured by AM General, utilize electric propulsion systems designed and manufactured by Gould specifically for the postal delivery type application. The system design stressed high efficiency, safety, cost effectiveness and satisfaction of the specified performance requirements. The key performance requirements in this specification were:

Range: 32 Km (20 miles) with 300 stop/starts

Top Speed: 53 Km/hr (33MPH)

Acceleration: 0 to 48Km/hr (30 miles/hr) in 20 seconds

Gradeability: 0 to 16Km/hr (10MPH) with 122 m (400 ft)

Battery Life: 4 years

sion of the standard gasoline-powered van supplied to the U.S Postal Service in large quantities. Suspension and brake modifications were made to accommodate the higher weight of the electric version. Final curb weight of the electric version was 1651 Kg (3,632 lbs.).

In selecting a propulsion system approach and designing the system, major attention was given to the following requirements:

- Efficiency—In order to minimize battery size and vehicle operating cost, the maximum propulsion system efficiency available with state-of-the-art components was sought.
- Performance—The vehicle must satisfy the specified acceleration, top speed, and gradeability requirements but should not significantly exceed these requirements if battery energy consumption is to be minimized.
- Safety—The vehicle must be safe to operate and always under the operator's control. Failures should shut down the system. Shock hazard must be eliminated.
- Maintainability and Serviceability—Easy serviceability was considered critical, with particular attention given to easy battery accessibility and serviceability.
- Life—Long service life is required for cost effective operation. The battery is the largest single contributor to operational cost, thus proper battery selection is important.
- Quiet, Smooth Operation—An electric vehicle is expected to be quiet and smooth, thus particular attention was given to this area.

An additional consideration was component availability on a short time schedule with a minimum of tooling. This latter requirement restricted consideration to DC motors, since AC motor controllers could not be available within the

sions and final drives could be considered. The U.S. Postal specifications preclude the use of a manual transmission and clutch, thus further restricting the consideration to drive systems that were automatic in nature.

The system selected for this application was the direct-coupled, separately-excited DC motor with a thyristor chopper used for armature voltage and field voltage control. This system offered significant efficiency advantages in all cases plus cost and weight advantages in most cases.

The propulsion battery is the heart of any electric vehicle. The key battery characteristics considered for this application were:

- Life—The specification required a minimum life of four years.
- Energy Density—The battery must have sufficient energy available to allow the vehicle to meet the specified vehicle range of 20 miles with 300 stop/starts per the specified postal mission.
- Power Density—The battery's power output must be adequate to allow the vehicle to meet the acceleration requirements.
- Serviceability—The battery configuration should allow easy servicing, i.e., addition of water, cleaning, etc., when installed in the vehicle.

Of course, only lead-acid batteries were available in a practical sense. From the types available, the semi-industrial battery was chosen as the most cost-effective of those that allowed the vehicle performance requirements to be met.

The completed vehicle has been tested against the requirements of the U.S. Postal Service specification on three occasions. Representative achieved performance is:

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Cruise Speed: 53-64 Km/hr (33-40 MPH)

Acceleration: 0 to 48 Km/hr (30 MPH) in 20 seconds

Gradeability: 0 to 26 Km/hr (16 MPH) on a 10% grade

The vehicle exceeds by a significant margin all of the specification requirements except acceleration. It just met the acceleration requirements.

Driver acceptance of the vehicle has been generally good. The only consistent complaint among drivers has been the slow acceleration.

Fleet operation has not shown any major design deficiencies associated with the propulsion system drive train. Fleet uptime has stayed over 96 per cent with operation generally in the region of 98 per cent. This is most favorable, considering the newness of the propulsion system design and the very limited test time prior to entering the production phase. Field experience has demonstrated, however, that the problems associated with introducing significant quantities of a new electric vehicle into field use should not be minimized. Minor problems can become major if not remedied promptly. Minor defects become serious if they must be corrected in a large number of vehicles. This must be recognized in any new program and appropriate provisions made to correct expeditiously any problems or defects ●

2.

A CAR FLEET IN THE UNITED KINGDOM

by N.S. Wrench and D.F. Porter,
The Electricity Council, United Kingdom

The Electricity Council decided in 1966 to undertake a project with a fleet of electric cars to evaluate the capability of present technology and to quantify the extent of further development necessary. The car is the Enfield 8000, a two-seater saloon, powered by eight traction monobloc batteries and one auxiliary 12V battery. It has a 48V, 6 kW series wound motor, controlled in six stages by voltage switching (12, 24 and 48V) and field weakening at each voltage. There is no regenerative braking. The curb weight of the vehicle is 2,150 lbs (975 kg), and the construction is a steel square tube section chassis with aluminum body panels.

The vehicle is fitted with an on-board dual charger which independently recharges both the 48V and 12V batteries in 8 hours, using a domestic 240V, 13A single phase mains supply.

The maximum speed of the car is 40 mph (64 km/h), and the 0-30 mph (0-48 km/h) acceleration time is 12.5s. Vehicle driving range on a full battery charge is between 24 and 56 miles (39-90 km), depending on driving conditions. The Enfield car meets all current legislative requirements in the UK (no exemptions were sought), including the 30 mph (48 km/h) frontal barrier impact test.

A total of 66 vehicles are participating in a national project organized by the Electricity Council, and they have now been in service for periods of two to three years.

The total fleet mileage is 193,266 miles (310965 km) (April 1978), which corresponds to an average of only 2,928 miles per car. However, there is a wide diversity in the extent to which the cars have been used. There are a number of reasons for this diversity, mainly associated with the manner in which the project was originally organized. As a result, valuable lessons have been learned.

First, the decision to spread the fleet throughout 14 different Electricity Boards resulted in problems of project management and monitoring. On the other hand, in those areas where cars have been grouped in numbers of, say, four or five, it has been possible to develop local centers of expertise and ensure a regular maintenance program, with a resultant higher level of usage and enthusiasm on the part of the staff. The following conclusions can be drawn for those vehicles for which good repair maintenance records exist:

1. Unscheduled repairs, which were running at a fairly high level early in the project, have shown a marked fall, in line with the elimination of "teething troubles" with various components, principally the charger and controller.

2. By far the major item of routine maintenance is the topping up of batteries. The provision of a single point manifold topping up system is seen as an essential feature of future battery designs.

3. The normal automotive and body components of the vehicle have proved very reliable, with a very small servicing requirement, other than that arising from accident damage.

4. There have been no problems at all with the mechanical drive chain. The motor has proved 100% reliable, and no motor maintenance has yet been required.

5. The costs of servicing are dominated by the battery replacement cost. Indeed, battery depreciation is the major factor in vehicle running costs.

It is therefore of paramount importance to develop batteries that not only provide the required range and performance but also have a competitive cost per mile over their life. Having concluded the first phase of the project using SLI batteries, we have now embarked upon a major evaluation program of "lightweight" traction batteries as they become available from various parts of the world. The battery evaluation program is still at an early stage; we plan to expand both the number of types and the numbers of each type on trial in order to gain a comprehensive set of data under a variety of operating conditions.

The incidence of charger faults was high in the early stages of the project and was aggravated by poor quality control in the manufacture of the 48V mains transformer. This problem has now been cured by the substitution of good quality transformers, and these replacements are proving fully reliable.

We feel that there is very substantial scope for improvement in on-board vehicle charger design, particularly with a view to reduc-

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ing its size and weight. In this context, we are following closely the development of high frequency chargers and hope to evaluate this type of charger in the Enfield car during the next phase of the project.

The Enfield project has, over the last 2-3 years, provided us with very valuable information in two general areas: the organization of a major electric vehicle project and the technical aspects of an electric car that require further development.

There are valuable lessons to be learned in the first context, and it is to be hoped that others contemplating EV development and demonstration projects will take note of our experiences, particularly with regard to the way in which vehicles are geographically distributed. A regrouping of larger numbers of vehicles in a smaller number of locations is planned for the Enfield project, and we expect this to prove highly beneficial in terms of vehicle maintenance, project management and monitoring of results●

3.

BUSES IN FRANCE

by M. Moneuse, Electricité de France, France

Electricité de France has been experimenting with electric buses since 1972, utilizing various bus models and operating projects in several different areas.

The most important demonstration of electric buses in France has taken place in Tours. These demonstrations were developed by the local authorities in liaison with the Directors of Electricité de France. They began two years ago in January, 1976, and ended two years later in January, 1978.

A town-center route was specially created for the tests. A run of about 4.5 miles in a figure-eight shape crossed the central area of the town, where little or no service was offered by existing bus lines. After a three-month trial period, the final route was established, with the following operational conditions: flat fare: 1 Fr., free for subscribers; stops at indicated points; possibility of additional stops upon request (both to get on or off); prolonged stop at the railroad station (the central point at the center of the figure eight); service every weekday afternoon; and service frequency fixed at 10 minutes.

This line was developed to contribute to the municipal efforts by ensuring a shuttle service between car parks and the town center. The large number of people who used this line attested to its usefulness, and it is still in service.

The tests were conducted over a period of 19 months (two full years with a 2½ month interruption each summer). Total mileage was 52,100 miles. Significant statistics include:

- Number of buses in use: 4, later 3 (3.6 on average)
- Average monthly mileage: 760 miles per bus
- Average daily run: 37 miles
- Average number of people per day: 450 passengers per bus
- Energy consumption from mains: 3.6 kWh per mile (charger efficiency 83 to 85%)
- Unavailability of vehicles: 12%. Actual unavailability was much less, taking into account the presence of two reserve buses during the first year.

The Tours experiment confirmed the following points:

- A maximum speed of 28 to 31 mph is sufficient for town-center service.
- Industrial lead-acid batteries are preferable to high performance batteries (they were changed at the beginning of 1977 when the buses were modified). Loss of range is largely offset by better battery reliability. Overheating is less (consequently losses), voltage more stable.
- Partial recharges are possible in Tours at the railroad station without disturbing the operational schedule.

Criticisms made by operating staff were on maintenance difficulties with mechanical parts (brakes, suspension, steering) where old or unadapted solutions were chosen, and on difficulties in dealing with batteries. Remarks do not bring into question electric traction, which was appreciated by both drivers and passengers, despite a certain amount of noise made by the vehicles at the end of the tests.

The Tours project and other experiments made by the Study and Research Administration of Electricité de France, involving over a million kilometers for light vehicles (1.2 tons) and 102,000 miles for buses, show essentially that lead-acid batteries of approximately 40 Wh/kg are short-lived, which is highly prejudicial to operational costs of vehicles. The amount entered under the heading "battery" is already 20 to 25% of the total cost in the most favorable circumstances, whereas that under "energy" is only 5%.

Future research should be directed towards looking for a compromise between the following three parameters: size of the battery, its energy-to-weight ratio and its cycle life—resulting in lowest possible operational costs.

The environment of a lead battery will also contribute to its proper utilization.

A centralized and very reliable waterfeed system and, for certain uses, a cooling system of batteries are necessary.

The state-of-charge indicator, apart from its useful psychological role, will make it possible to use batteries for operational purposes at an optimal discharge depth. In this respect the average discharge depth ensuring longest battery life (in miles) is not known. This knowledge would make it possible to lower operating costs. It should be noted that very few state-of-charge indicators for use on urban electric vehicles are available.

To resolve these problems, new experiments on vehicles are necessary. Utility vehicles and buses can be built with present technology to provide numerous services in towns. The French Public Administration is convinced of this and is undertaking work at present on vehicles better conceived than those previously tested●

From the paper: Evaluation of Experiments on Electric Vehicles at EDF up to a Million Kilometers.

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"Man reached the moon, as predicted, with an electric vehicle. If an electric vehicle can be got to the moon, surely it can be put on the road."

—The Rt. Hon. Lord Ironside
President of the Electric Vehicle Association of Great Britain

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JOYS OF THE AT-HOME GENERATION

IF THERE IS one thing sure in the imponderable decade to come, it is that the present colossal growth of machines and modes for entertaining ourselves at home will continue, and even accelerate dramatically. The Rockies may crumble, Gibraltar may tumble, and we may all learn to live with the two-dollar gallon of gasoline, but beyond a doubt (and just in time) staying home is going to be more fun than ever. Despite such new and nonsensical patterns of cultural linoleum as Charlie's Angels and Shaun Cassidy, the chances for getting prime entertainment from your television, stereo, video disc system (don't worry, by 1983 you'll have one), or even your own native desire to make music beautiful with your friends, have skyrocketed in the past 10 years. What follows is a compendium, by *SR* critics and contributors, of the best in home entertainment during the past decade, with implications for a more gloriously diverting future. O.E.

The High-Toned Tube

by Karl E. Meyer

THE 1970S TURNED OUT to be a made-for-TV spectacular. The home screen easily displaced Barnum & Bailey as the greatest show on earth or even in the solar system. We were given a ringside seat for high political drama—the fall of Nixon, the rise of Carter, and the Sadat visit to Jerusalem—and for remarkable close-ups, via Voyager, of Mars and Jupiter. So voracious was our appetite for real-life diversion that the "docudrama" became an accepted form. And for the first time since its inception, American television began offering a true composite portrait of our diverse nation. This decade was surely TV's most creative.

As never before, our public life gravitated around the medium's Argus eyes. Doubtless Richard M. Nixon would have been forced to resign regardless of television's influence, but it was television coverage of the Watergate hearings that built an overwhelming consensus as to his guilt. Home viewers spent an estimated two billion hours watching 300 hours of rotated coverage of the Senate and House inquiries in 1973 and 1974. (The President's farewell speech was viewed by 110 million people, an audience total exceeded only by the 1969 telecast of the lunar landing.)

Moreover, the cliché "global village" assumed reality when the camera followed Anwar Sadat on his "sacred mission" to the Israeli Knesset—a trip that itself was virtually agreed upon over satellite hookups with CBS's Walter Cronkite. Diplomacy acquired a new dimension as the Egyptian president in succeeding months made his case directly to American viewers, developing support for the historic treaty that would follow.

The distinctive quality of the decade's best programs derived from a Watergate-inspired desire to see American life as it is—without deception. Certainly the ratings success of *60 Minutes*, with its studied iconoclasm, was a 1970s phenomenon. After an indifferent start in 1968, the CBS news magazine acquired a huge Sunday audience ready for hard-hitting reports. (On one occasion, *60 Minutes* exposed the safety failings of the Pinto car, even though Ford Motors was one of its regular sponsors.)

CBS NEWS PHOTO

Mike Wallace, a 60 Minutes *iconoclast.*

A willingness to deal with uncomfortable subjects marked entertainment programming as well. Norman Lear rewrote the rules for prime time when his *All in the Family* (which premiered in 1971) turned into the decade's runaway hit. A whole new school of urban-oriented sitcoms was born of Archie Bunker's overall pockets, programs featuring ghetto blacks and Hispanics that dealt with once-taboo themes of abortion, homosexuality, and ethnic bigotry. No less impressive in their craftsmanship were the sophisticated Mary Tyler Moore productions, which made household names of Mary, Rhoda, Phyllis,

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Rosemary Harris and Fritz Weaver in Holocaust—*One of the tell-it-as-it-is docudramas.*

and Lou Grant.

The docudrama was a further, if problematic, illustration of the tell-it-as-it-is approach. Programs that purported to reveal the true history of the famous or infamous generated enormous ratings: the Franklin Roosevelts, Lee Harvey Oswald, Howard Hughes, Patty Hearst, Joe McCarthy, and Charles Manson. The better docudramas provided entertainment and honest popular education, but the form itself was brought into disrepute by programs that blurred the distinction between fact and fancy without adequate labeling. Nonetheless, the discovery that history could yield compelling drama—as in the case of *Roots* and *Holocaust*—marked a prime-time advance.

Escapism as always also flourished. Despite, or perhaps because of, a rising divorce rate, programs that centered on the family—*The Waltons*, *Happy Days*, *Family*, *The Jeffersons*—predominated. And for the middle classes, the nostalgic Edwardian soap opera, *Upstairs, Downstairs*, which proved to be the PBS

Upstairs, Downstairs—*Imported soap.*

hit of the decade, evoked a world of low taxes and plentiful servants.

Viewed in perspective, the achievements of the Seventies were formidable. The better programs, whether highbrow or lowbrow, set a standard for the coming decade. The industry can hardly blame us for complaining about the current and temporary (one hopes) retreat to mindlessness. ◉

Out of the Mainstream and into Numbers

by Irving Kolodin

THE SEVENTIES began, for the record listener, with the usual flood of mainstream material, of which three operas by Giacomo Meyerbeer (never before recorded) stood out like rafts on a desert. It is ending with three, four, or five (depending on when you stop counting) operas by Antonio Vivaldi, a composer rarely associated with that art form by patrons of the Met, Covent Garden, and even La Scala.

Some might therefore conclude that it was the decade of the opera lover. But it was also the decade of the Mahler lover, gorging on a feast of his symphonies from the first to the previously unavailable 10th. At another extreme, Erik Satie never had it so good, with Aldo Ciccolini's recording of every piano piece the lovable eccentric ever wrote. Was your interest Mendelssohn? Songs with words, songs without words, abounded.

So it was, on every side and in every category, a decade of diversity.

The subtle fact, however, is that the further the industry moves into these entirely admirable, wholly welcome fringe areas, the more remote they are from the interests of the mass market of record buyers. Almost any operatic curio by a reputable composer will find an immediate public response. But it is also likely to sit on store shelves undisturbed for months, once the limited market has been satisfied.

More than a few merchandisers long for the golden dawn of 1958, when stereo cast its unkind beam on mono recording, resulting in the kind of obsolescence that is the salesman's dream—something so different in perception that even the tone deaf could be persuaded that two speakers sounded better than one.

Some eager industrialists put money on their belief that quadraphonic was the stereophonic of the Seventies. The differences, after all, were doubled. But the industry couldn't get together on a common system, and the technicians couldn't create a convincing pattern of sound from the four speakers. Even if they had, one insurmountable obstacle remained: the resistance of many wives to the idea of two *more* speakers in the living room.

Is digital going to be the stereo or the quad of the Eighties? Ever since Thomas Edison traced a wavy line on a wax surface the sound at the output end has been produced by another wavy line—the analog of the vibrations at the input end.

In digital, the soundwaves are converted into numbers. The computerized device that analyzes them in the studio is matched by a counter-converter which reproduces frequency range, coloristic detail, volume, etc.

The immediate use of digital is restricted to production of the master. But digital will dominate the total sequence some time in the future, with different hardware as well as software. By this method, all the symphonies of Beethoven may be imprinted on a single disc whirling at supersonic speed. The symphony, or segment, may be selected at will.

At the moment, digital software has been used to record a program of Viennese music performed under the direction of Willi Boskovsky (London), the Bartok "Concerto for Orchestra" performed by the Philadelphia Orchestra conducted by Eugene Ormandy (RCA), and sundry other matter.

In all that I have heard, priority is on dynamic emphasis rather than emotional empathy. Distortion is by-passed, leading to louder louds, softer softs. The big bass drum is bigger, the high flute (piccolo) higher. What I do not find is greater *likeness* to the musical sound.

At this point the impression digital technologies convey is more quantitative than qualitative. Music by the numbers now reproduces everything but the slight differences that distinguish the highly human from the craftily inhuman.

The record buyer will have a lot to tempt him and a good deal to resist in the Eighties. ◉

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Technical Knockouts

by Ivan Berger

IT'S HARD TO isolate the 10 most influential home-electronic developments of the decade, because they overlap one another and the decade itself.

• The biggest one is "Large Scale Integration" and the most recent "Very Large Scale Integration," which put enormously complex circuits onto single, plug-in chips, reducing even a computer to a $20 part. LSI and VLSI have brought us home computers (about 200,000 of them now), the ubiquitous calculator, video games, and computerized control of everything from TV sets to microwave ovens.

• Digital displays are most familiar to us in calculators and watches, but we'll be seeing them in hi-fi equipment, automobile dashboards, and virtually every other electrical device, soon.

• Digital sound recording, which just surfaced, is already bringing us regular phonograph records of noticeably increased fidelity. In the next decade, it will bring us new forms of records that are absolute replicas of the studio master recordings.

• And we'll be playing those new records on video tape recorders and video disc systems, developments that hit the home in this decade, with their greatest impact due in the next.

• Satellite transmission may have as great an effect on televiewing as video recording is beginning to. It's bringing live events across the world, allowing better TV sound, and opening up new program distribution channels—first to stations, then perhaps direct to homes.

• Two-way cable television, allowing viewer interaction with programming, is running now in Columbus, Ohio, and elsewhere. Using fiber-optic technology emerging from the labs, two-way cable will spread—bringing new forms of programming and totally new communication services. Look for a link between that and "teletext" to bring "magazine pages" and information from data banks to your home screen.

We may not want two cars for every garage, but we'll all have screens like the Advent soon.

• And those screens will be bigger. Front-projection TV (there were rear-projection home sets 30 years ago) brought the first big home screens in 1974; and sometime next decade, flat, self-contained screens will replace projection and conventional tubes.

• In audio, the biggest change has been the high-fidelity flowering of the tape cassette. Originally just a toy for spoken words, the cassette has become, thanks to developments like Dolby and metal-particle tape, a medium of astonishing fidelity—astonishing, at least, to those who knew it 10 years back.

• Another revolution has been the growth of sound-processing accessories to home audio systems. Equalizers that offer five to 30 "tone controls," delay systems that make rooms reverberate like cathedrals, and other devices give the home listener more sound control than most studios once boasted.

• Continuing improvements in filter technology—first ceramic filters, now surface-acoustic-wave and comb filters, have made radio and TV easier to tune precisely and more immune to interference. Our ever more crowded airwaves will make these improved filters increasingly important. ◉

Ivan Berger, a New York-based freelance writer since 1962, is currently hi-fi columnist for the Los Angeles Times *and a technical editor of* Video Magazine.

One of the sound-processing accessories, which can give more sound control than a studio.

The Beat Grows On

by Robert Palmer

A LIST OF THE best pop records of a decade, it seems to me, ought to furnish some sort of provisional definition of the pop music of that decade. The choices are bound to be subjective, but questions of balance should be figured in along with questions of quality. If Latin music, reggae, electric jazz, and progressive country music were significant developments in Seventies pop, then the best records in those categories should be included. This strategy leaves no room for hard-core jazz, but how can one compare a Sonny Rollins cadenza or a Sarah Vaughan improvisation, moments captured by the tape machine in the heat of creation, with pop records that were painstakingly assembled layer by layer, or at least recorded with a prearranged goal in mind? Nor can music that drew its inspiration from the pop of earlier decades—that of Sondheim, Hamlisch, Midler, for example—be considered eligible. Disco should be included, but disco has not yet produced an entire album of this quality. My guess, however, is that it will.

THE BAND, the Band (Capitol). The Band both shaped and transcended the emerging country-rock genre of the late Sixties and early Seventies with these echoes of Anglican hymns, river baptisms, bluegrass, marching bands, covered wagons, union organizing, and "The Night They Drove Old Dixie Down."

EXILE ON MAIN STREET, the Rolling Stones (Rolling Stones Records). This double album, with its cover montage of Robert Frank's Americana, its updated delta blues, its unforgettable ballads, and all-out rockers like "Tumbling Dice," will stand as the definitive Seventies statement from the Rolling Stones, still the most powerful and convincing group of its kind.

BLOOD ON THE TRACKS, Bob Dylan (Columbia). Just after he decided he was through being mellow and just before he succumbed to a period of confusion and obscurantism, Dylan made this wrenching, eloquent record.

RED-HEADED STRANGER, Willie Nelson (Columbia). This album also shaped and transcended a genre, progressive or outlaw country music. Nelson became the biggest country star of the late Seventies without playing the game according to Nashville rules—but he was never one to play by the rules.

THE HARDER THEY COME, Soundtrack (Mango). Reggae has not

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Bob Dylan—Pre-obscurantism.

quite taken off in America, but it has freshened the rhythmic content of the rock and soul mainstream and provided pop with a much-needed leaven of intensity and charm. This compilation, with Jimmy Cliff, the Maytals, and others, is still the most unfailingly rousing single reggae album.

INNERVISIONS, Stevie Wonder (Tamla). At his best Stevie Wonder is an incomparable melodist and a savvy street poet. This is his most impressive one-man-band tour-de-force and includes some of his more memorable contributions to popular songwriting.

CONCEPTS IN UNITY, Grupo Folklorico y Experimental Nuevayorquino (Salsoul/Salsa). The Grupo Folklorico, a temporary alliance between some of Latin music's most dedicated antiquarians and most progressive young firebrands, stayed together long enough to produce this two-record set, a panorama of Salsa's roots and a provocative suggestion of where it might be headed.

LAYLA, Derek and the Dominos, (Atco). Eric Clapton and Duane Allman, the finest rock guitarists of the early Seventies, never again matched this apotheosis. Allman died, and Clapton mellowed.

MYSTERIOUS TRAVELLER, Weather Report (Columbia). Weather Report has consistently made the most creative music in the often justly maligned jazz-rock or fusion idiom, and *Mysterious Traveller*, with its dense overlays of electronics and ethnic instrumentation and its cool, winding melodies, is the group's recorded zenith.

WHAT'S GOING ON, Marvin Gaye (Tamla). Gaye is awfully full of himself, but his sensitive singing, stylistic range, and arranger's intelligence are among black pop's most valuable assets, and this concept album effected far-reaching changes in the soul mainstream. ◉

Robert Palmer is a regular contributor to the New York Times *and* Rolling Stone.

The 17th-Century High

by Owen Edwards

THE SOUND OF the cymbal, timbrel, and lyre may not be abroad in the land just yet, but don't be surprised if you're soon awakened by the unaccustomed bleatings of viols and sackbuts as your neighbor's early music group warms up for its Sunday morning hoedown. Perhaps no aspect of the Seventies boom in bringing entertainment back home has been so dulcet and unexpected as the phenomenal rise in ancient music as tuneful self-therapy.

Rooted in the bean sprouts and Earth Shoes return to basics that characterized the Sixties, the performance of music

THE BETTMANN ARCHIVE

Early music lute player.

composed before the Baroque era (pre-1750) on authentic instruments of the period has continued to grow apace even as the flower children have turned to investment banking and entrepreneurism for survival. What was once a counter-culture phenomenon has become a middle-class pleasure and a first-class business.

Instrument makers here, in Europe, and in Japan; teachers; and early-music concert groups are propelling the trend into corporate profits and standing-room-only audiences. Summer workshops, once the narrow province of a handful of earnest eccentrics, now abound. Typically, the American Recorder Society's summer workshop at Hampshire College in Massachusetts has so increased its enrollment in the past few years that it can now easily assemble a 60-piece Renaissance orchestra of players of professional caliber.

At the heart of this renascence is the primal need to make music, a need simply not satisfied by applying an electronic armature to a spinning disc. There was a time when every parlor had its own piano (when for that matter, parlors still existed) and the family quite naturally gathered around for group songfests. But dwindling space and money have made the piano rare. Recorders, the wooden flutes that are the *sine qua non* of the early-music movement, have come to fill the instrument gap. Relatively easy to learn, but challenging and satisfying as a source of music, the recorder becomes more popular each year.

Moeck, a German company that is one of the prime sources for high-quality ancient instruments, has double shifts working to meet the demand—not only for recorders, but for such exotic-sounding and -looking pieces as racketts and krumhorns. The Aulos plastic recorders, produced by Toyama Musical Instruments Company of Japan, have such an amazingly accurate tone that many teachers now suggest students use them until their level of proficiency has reached the high amateur realm. Certain publishers like Horticus Musicus and Schott are specializing in the music of such pre-Baroque composers as Boismortier, Jacques Hoteterre, and William Boyce; and as the available music becomes more varied, the instruments being marketed grow more complicated, harder to build and to master.

The family of viols and valveless horns are luring established musicians out of their usual chairs and causing seismic shifts in well-grooved classical careers. There is a freedom of expression in early music, a closeness to improvisation somewhat akin to jazz, that appeals to musicians who are chafing under the orderly tyranny of 19th-century orchestral music.

Typical of the "emigrés" into early music are Richard and Elaine Henzler, who operate Courtly Music, one of Manhattan's several overworked recorder schools. Both Henzlers were profitably employed as bassoonists when they found themselves becoming increasingly enamored of early music. Recorder playing has come to dominate their musical interests so totally that they recently sold their once-cherished bassoons in order to buy several fine Moeck ebony recorders.

As professionals perform to full houses, making the public aware of how rich the heritage of early music is, and as amateur groups grow in numbers and ability, the trend gathers momentum. There seems no question that what has been the sweet sound of success in the Seventies will grow to soothe the anxious psyches of our next decade. ◉

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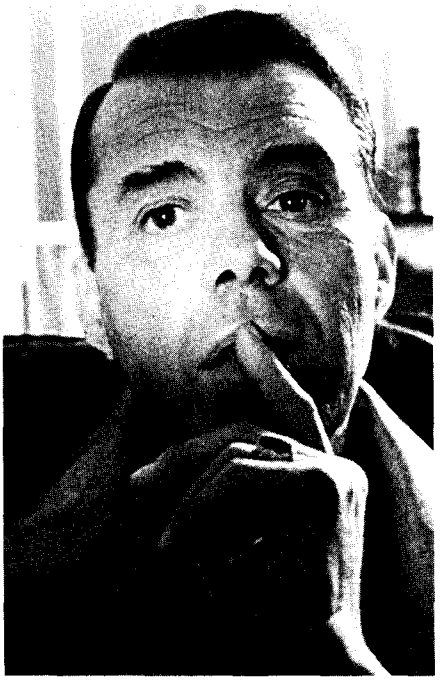
Flics of the Foreign Wrist

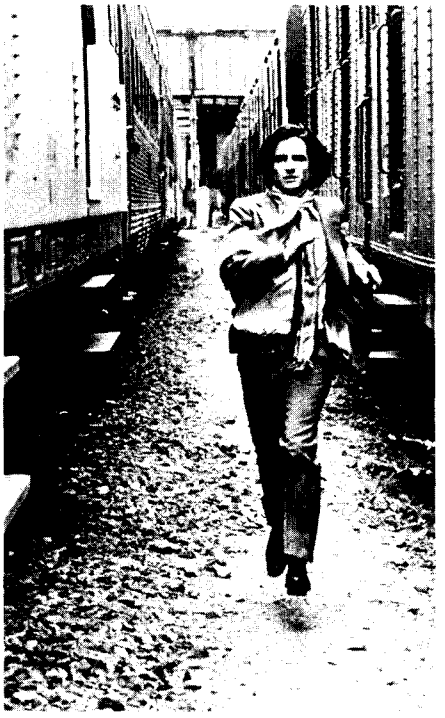
IT IS TIME to look at this year's imports. In *Despair* (New Line Cinema) Rainer Werner Fassbinder, the much admired German director, attempts an English-language film. It comes off with considerably more success than Bergman had with *The Serpent's Egg* or that Werner Herzog seems to have had with *Nosferatu* (as yet unreleased). One reason is that Tom Stoppard wrote the adaptation of Vladimir Nabokov's novel. It is hard to imagine two writers more sensitive to the exquisite and revelatory absurdities of the English language. Another is that Dirk Bogarde gives the performance of his life as Hermann Hermann, the bifurcated hero.

Hermann Hermann is a Russian emigré chocolate manufacturer in Berlin in 1929. He is enigmatic about his past: "Most of my information comes from forged documents." He may or may not be Jewish. His wife is mindless and voluptuous. "Such a stupid woman," he says to her. "Intelligence would take the bloom off your carnality." He is obsessed by the phenomenon of dissociation—the man who stands outside himself, as Hermann stands outside himself when he makes love to his wife. "I'm thinking of writing a book about dissociation," he confides to a bearded man he mistakes for a psychiatrist—"maybe two books."

His conviction of dissociation becomes



Dirk Bogarde as the obsessed Hermann.



Jean-Pierre Leaud as the hapless Doinel.

so fanatical that he sees his own features in the face of a vagrant to whom he in fact bears only a cursory resemblance. In his delusion he contrives an elaborate plot by which to cash in on this supposed double. In the background are the ominous sounds of Hitler in his rise to power. Germany too was a case of dissociation. As Goethe is said to have commented, "Zwei Seelen wohnen, ach! in meiner Brust." (Two hearts beat in my breast.)

Armed with Stoppard's elegant script, Bogarde's richly comic performance, and a fine supporting cast of German character actors, Fassbinder did not really need to indulge in so much surplus directorial mystification. But the film survives the fussy and distracting camera motion and editing. *Despair*, original and eccentric, was greatly enjoyed by this reviewer.

In *Love on the Run* (New World Pictures) François Truffaut and the actor Jean-Pierre Leaud offer the fifth installment in the hapless life of Antoine Doinel. The trouble is that Antoine has not grown up perceptibly since his first appearance, in *The 400 Blows*, 20 years ago. He is now a little boy of 30, so inordinately self-centered and so carelessly egomaniacal that one wonders why beautiful young women (especially the delicious Marie-France Pisier and a new charmer called simply Dorothée) put up with him, or why Truffaut himself does. As one of Antoine's loves says to another, "He wants everyone to pay for his unhappy childhood"—including, finally, the audience.

The film, one supposes, will be of most interest to Truffaut scholars. It is crammed not only with allusions to but clips from the earlier Doinel films. Still, like everything Truffaut does, it is a pleasure to watch. Unlike Fassbinder, Truffaut does not go in for direction that calls attention to itself. His genius, as a wise old film producer observed to me after we had seen the film together, lies in his serene ability to zero in on his characters at the critical moments and thereby distill the essence of their experience. Truffaut packs an enormous amount of life and love and death into 93 minutes. His other supreme quality is the sweet and imperturbable realism that pervades his sense of human relations. But perhaps we have now had enough of Antoine Doinel.

Yannick Bellon is a French woman director, and her film *La Femme de Jean* (Joseph Papp), made in 1974, has taken an unconscionable amount of time to get here. It is a remarkable anticipation of Mazursky's *An Unmarried Woman* and, in some ways, a more satisfactory movie. Nadine, abandoned by her husband for another woman after 16 years of marriage, suffers the usual shock to self-esteem and goes through the usual stages of self-pity, hysterical efforts to have a good time, a new love, ego restoration, and finally the conquest of maturity. When her husband wants to come back, she can equably dismiss him and say, "I've changed, I'm a different woman."

Bellon's style—rapid, episodic, cryptic—depends on cumulative effect. The first 40 minutes are frustrating. Then suddenly the bits and pieces begin to cohere, continuities of character emerge, attention and belief are seized, and the movie develops considerable momentum and impact. France Lambiotte illuminates the passage from vulnerability to self-sufficiency in a performance of great beauty. *La Femme de Jean* lacks the polemical stridency of the works of the other French woman director Agnes Varda (*One Sings, the Other Doesn't*) and relies instead on a quiet elliptical sense of human truth.

—Arthur Schlesinger, Jr.

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Enter the Creature

IF *DRACULA* IS here, can *Frankenstein* be far behind? In various dramatic adaptations, Bram Stoker's novel, *Dracula*, is currently the terror of the American stage. For over a year two different versions have been running simultaneously in New York (one on and the other off Broadway), an unprecedented phenomenon. Other productions are on tour and a movie version was just released. The odd combination of a timeless genre (horror stories) and our nostalgia rage is mysteriously the commercial combination of the moment.

Less mysterious is the validity of a monster story on stage. We've been accustomed to taking our horror tales at arm's length—reading and imagining them, or seeing them in movies. But if the point is to scare us, what could be scarier than a monster in the flesh?

So, with *Dracula* successful, somebody was bound to put *Frankenstein* on stage, which is exactly what the Loretto-Hilton Repertory Theatre in St. Louis did. The script was an earnest adaptation of Mary Shelley's novel by Victor Gialanella, the company's production manager and a previously unproduced playwright. Gialanella's play was rough around the edges and overly faithful to the Shelley original, but it was good enough. While its story details and philosophical references made for slow going at times, everything that had to do with the creature (Shelley never called him the "monster") played as if to the theater born. No question, Gialanella's script caught the legendary excitement of the *Frankenstein* story.

The Loretto-Hilton's production began at a cemetery, with corpses being disinterred and stage fog rolling its way toward the audience. Organ music (Mussorgsky, naturally) rumbled ominously. This was all as it should have been, for *Frankenstein* is by now a ritual, and it is for the familiar, frightening stations of its cross that audiences come. Too much of the first act concerns itself with Dr. Frankenstein's household: life with father Alphonse Frankenstein, and younger brother William, both characters new to me. And the occasional jokes are at the story's expense. The fun in any *Frankenstein* lies in its being played straight.

When Gialanella's script and Robert Darnell's production move to Dr. Frankenstein's laboratory, however, we start getting what we want at last. The Victorian electrical claptrap is in order. The creature is strapped down all too inadequately, as we notice from previous encounters. Darnell collaborated with costume designer John Carver Sullivan and Keith Jochim, who played the big boy, to make the most convincing non-Boris Karloff creature I've ever seen. He is large and ugly, of course, but he also has a certain lovability, vulnerability, and naiveté.

The big boy—strapped down none too securely, as we notice with relish.

Once the creature is on his feet, this play happens, no doubt about it. Its natural energy captures the audience. Its flashing lights and strangulations and shriek-producing unexpected appearances are the stuff of horror stories. There are also oddities. This creature seems like a monstrous philosophy student, discoursing on the nature of creation. "I could have been your Adam but am instead your fallen angel," he says. The thought is provocative, but the phrasing is no way for a creature to talk. Inclusion of this material reflects Gialanella's interest in making the story deeper and more faithful to the Shelley original. Even the program cites *Paradise Lost*. All of this is too pompous. The creature's dialogue should be briefer and simpler. Also, too many of his terrible adventures are described when they should be dramatized. The audience should see him kill Dr. Frankenstein's young brother.

Gialanella's play provides certain insights into the creature that the movie versions didn't explore. His solitude. His sense of injustice about having done nothing to deserve his monstrous condition. On the other hand, Gialanella examines aspects of the creature that have been shown in the film versions: tenderness toward fellow innocents (children, women, the blind man), a lack of awareness of his own strength. These elements, common to many monster stories, are part of an overall mythology. But Gialanella has not adequately explored all of them. He introduces the romantic and sexual yearnings of the creature in the person of a mate he pressures the doctor into making for him, but she is only briefly dealt with and never comes to life. More could be made of this.

I hope that such improvements will be made as the play works its inevitable way toward major productions. I also hope that the basic honesty and good naturedness of this St. Louis production is maintained. The Loretto-Hilton Repertory Theatre is not one of America's more publicized regional theaters, but it is a solid institution with a big, supportive audience. It presents substantial works in a beautiful and well-equipped theater. *Frankenstein* is an imaginative and theatrical choice. I suspect the subscribers have had themselves a world premiere that many will be seeing elsewhere in the next few years.

—Martin Gottfried

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A School Apart

AMONG PRIVATE music schools in America, Mannes, in New York City, is one of the oldest and best. It came into being not through a rich man's whim, like Eastman in Rochester, New York, or the Juilliard in New York City, or the Curtis Institute in Philadelphia. Prior to all of them, it expressed the determination, and devotion to music, of one relatively poor man—David Mannes himself.

A New Yorker by birth, Mannes was 93 when he died in 1959. The violin was his instrument, and, after a modest beginning as a back-desk man in the old New York Symphony, whose conductor was Walter Damrosch, he was appointed concertmaster in 1898. Just about that time, he married the boss's daughter, Clara Damrosch, who remained a companion for half a century.

Mannes was a tall man of distinguished mien, who performed innumerable public-spirited acts in New York. Among them was a famous series of concerts, held between 1919 and 1947, in which he conducted the New York Symphony in the Metropolitan Museum of Art eight Saturday nights in the winter. The orchestra played from the top of the museum's imposing center staircase, and as many as 16,000 music lovers were accommodated free of a January evening.

The most lasting and influential of all his acts was the school which he created in 1916. Though larger, more richly endowed institutions captured the spotlight of publicity, Mannes maintained a steady course. The student body was purposely restricted in size to stress a principle that its founder deemed essential—close contact between students and teachers.

The Mannes children could hardly be unaffected by so artistic a pair. Leopold Damrosch Mannes, the oldest (born in 1899), was an excellent musician and a composer of quality, but also a man with a scientific turn of mind. In collaboration with a crony, Leopold Godowsky (son of the famous pianist of the same name), he perfected the process of color photography known as Kodachrome.

Eventually, as his father aged, the son accepted the maintenance of the school as his primary obligation. Many musicians of ability who were uprooted by the Nazi upheavals of the Thirties sought refuge in America; more than a few of them found a place of honor and esteem at the Mannes school.

Included was a nonpolitical victim of the war, the conductor of the Glasgow-based Scottish Orchestra, who was stranded in New York when he received a cable saying (in effect): "Don't come back. Orchestra disbanded because of military call up." Somehow Mannes found a place for him on its faculty. That was how George Szell survived in New York until a place for a conductor of his skills opened up at the Metropolitan Opera. From there he went on to Cleveland, to build its orchestra into one of the world's best.

Mannes' planned merger was scotched when poet Marya Mannes rallied celebrated musicians and alumni against it.

As Leopold Mannes carried on his father's work, with great energy and, no doubt, some Kodachrome-derived money, it became apparent that academic credentials were essential for musicians entering the competitive musical world of the Fifties. So, with the help of his associates, he added the academic faculty through which the Mannes School became the Mannes College of Music. It was steadily expanding when Leopold Mannes suddenly died in 1964.

That not only eliminated the Mannes influence from the school, but also the Kodachrome money, resulting in more financial problems than a school of high standards could comfortably sustain. When Risë Stevens of operatic fame became president in 1975 hopes for stronger financial support, and the creation of an endowment fund, were bright. Three years later she resigned over a policy dispute: The school's trustees opposed her strong bent to an operatic curriculum.

After this point, rising costs and inadequate fund-raising brought the crunch to the point where a majority of the institution's 13 trustees concluded that the only way out was a merger with another school. A willing collaborator was the Manhattan School of Music, which, when the Juilliard moved downtown to new quarters in Lincoln Center, acquired its former buildings uptown, near Columbia University.

Manhattan's president, John Crosby (also known for his summertime success as director of the Santa Fe Opera) had the space, and the interest, to accommodate some of Mannes' faculty and students. But he could not promise to perpetuate the student-faculty relationship which made Mannes and its surroundings on East 74th Street distinctive from the start. The school had always drawn many of its students from the children of the heavily populated neighborhood, as well as attracting nonprofessionals who cherished its well-structured music extension courses.

Sentiment among the faculty and students was strongly against the merger. Sentiment for the merger was strongest among 11 of the 13 trustees. A *fait accompli* was announced in February.

Here, however, another descendant of the Mannes line, and the last living member of the tribe, rose to defend what was more than family tradition. Marya Mannes, author, social critic, poet, humanist as well as feminist, applied her influence and that of one other dissident trustee to the accomplishment of an apparently impossible task.

By invoking suitable legal procedures and enlisting the aroused support of a substantial number of prominent musicians, the two turned public opinion against the merger, thus chilling the enthusiasm at Manhattan, as well as among some of the borderline trustees at Mannes. The minority, for a change, had managed to overcome the will of the majority.

This summer, a new board of trustees, determined to establish an endowment program, will have to engage in energetic fund-raising. But at least the opportunity has not been foreclosed. Nor has the proven ability of the Mannes faculty to produce such distinguished young artists as pianist Murray Parahia and mezzo-soprano Frederica von Stade been dissipated.

Above all, the non-merger should encourage supporters of schools elsewhere in opposing unwise "easy way out" decisions by trustees.

As all too many examples in the past have demonstrated, where two things are merged—even in the arts—one is inevitably submerged.

The struggle to avoid submersion in this instance is a lesson of far-reaching application. It may be the best teaching Mannes will accomplish this year.

—Irving Kolodin

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Nervous Time.

Spring here at Beringer, in the Napa Valley wine country, arrives in a hundred colors. But the official color is yellow—a bright, brash, everywhere, mustard weed yellow.

And, like every other adolescent, spring gives us something to worry about every day.

If the rains stay too long, the tractoring has to wait. But a clear, dry, star-filled night that would send a poet into verse sends us into the fields to fiddle with the heaters and test the wind machines. On a night like that, spring can do a flawless imitation of winter, as careless as it is cruel. It's called "frost."

Up in the caves behind Beringer's Rhine House, we're tasting all our new '78 wines, and we're releasing the '77 Napa Valley Chardonnay we bottled in February.

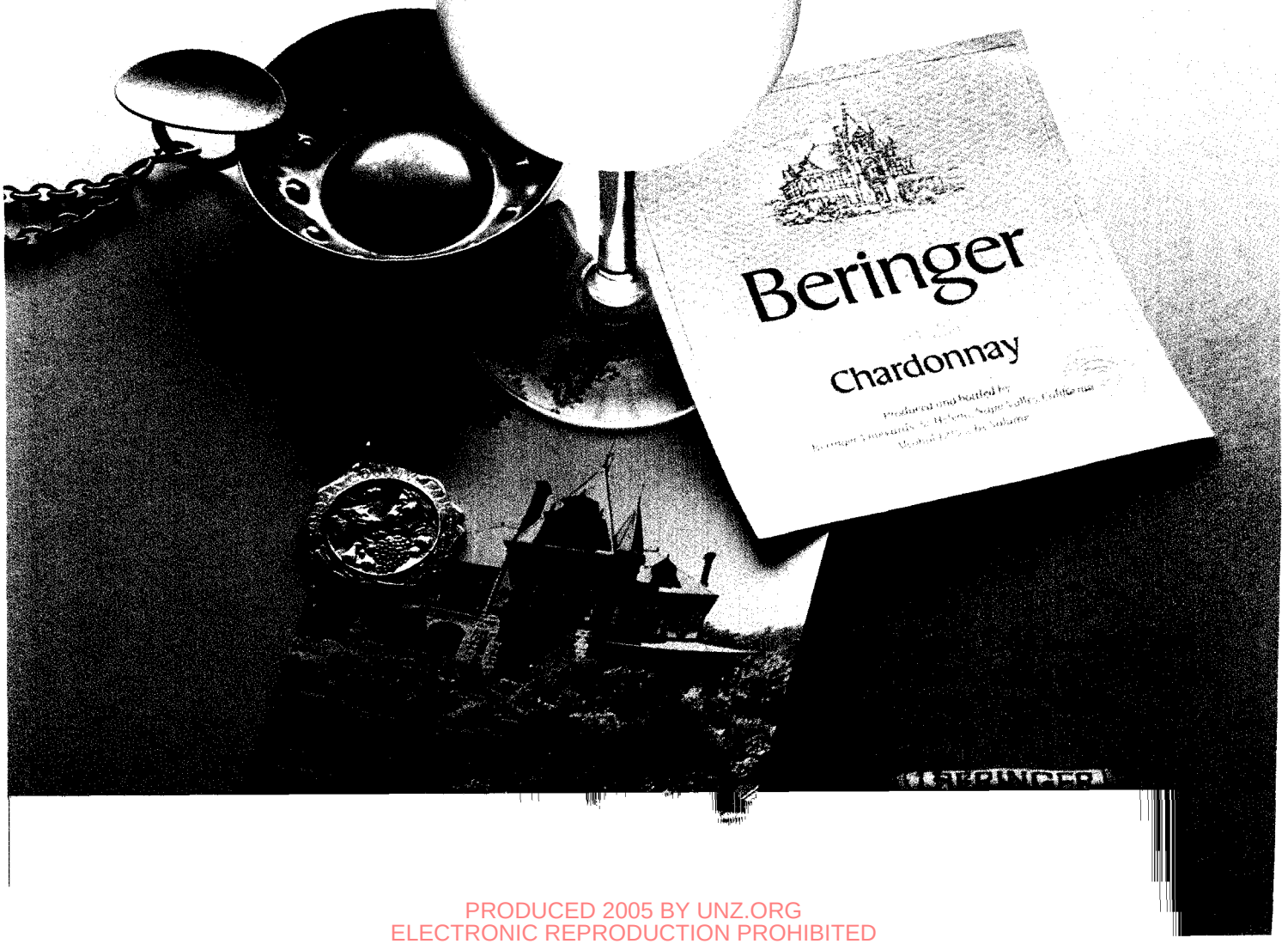
Well, we're sort of releasing it. The wine-master won't let it go. He wants it binned here to bottle age until summer. This is a big wine, and time is kind to big wines. Time brings a bouquet and a taste that blossoms in the mouth. (Some wines, like the gamays and chenin blancs, are wonderful, but never big. Others, like the chardonnays and cabernets are big, or never mind.)

Suddenly, spring speeds up. March promises April. April rehearses May. We spend a morning walking one of our vineyards below Inglenook, just above Robert Mondavi's. It looked like a cemetery on the moon a week ago, but now every vine glistens with fat, shiny new buds.

We're going down to Yountville tonight. The Western Opera Theatre is giving a special performance of La Boheme, and then there's a reception for the cast at Domaine Chandon.

But even before we get there the night is a success. The air is warm. We congratulate one another.

Spring has finally decided what it wants to be when it grows up. It wants to be summer.



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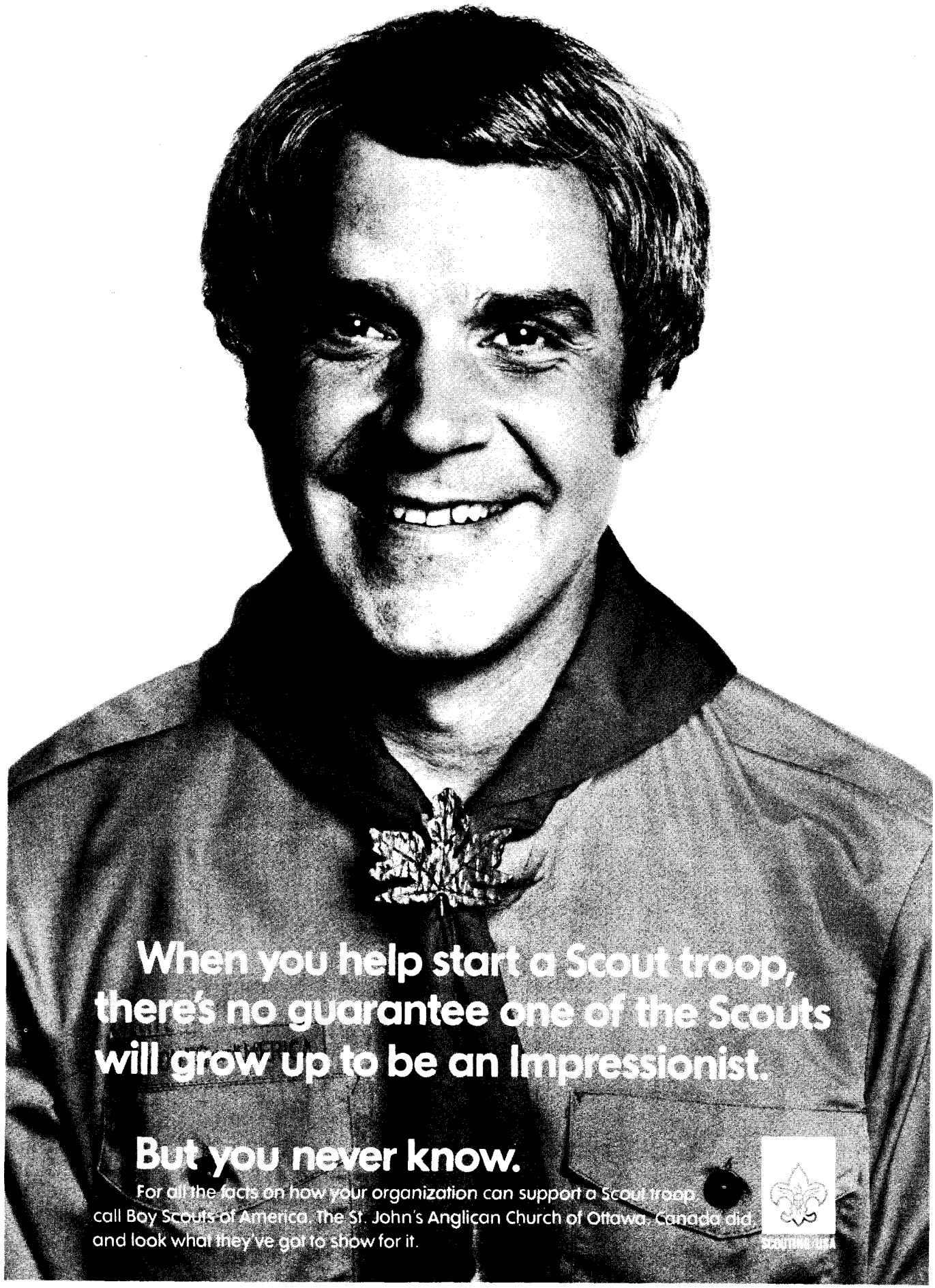
When you help start a Scout troop, there's no guarantee one of the Scouts will grow up to be an Impressionist.
But you never know.
For all the facts on how your organization can support a Scout troop, call Boy Scouts of America. The St. John's Anglican Church of Ottawa, Canada did, and look what they've got to show for it.
SCOUTING, USA

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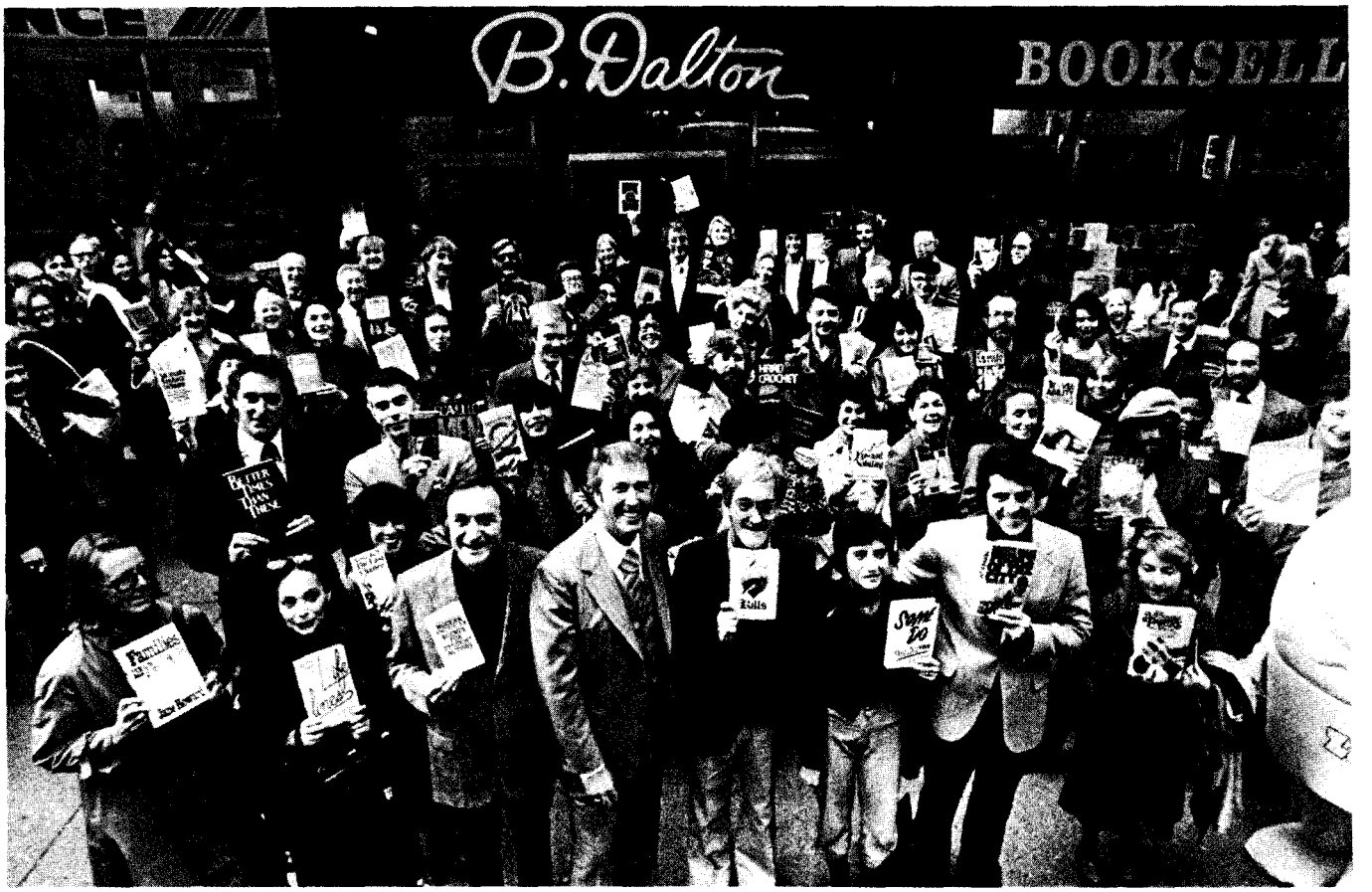
B. Dalton: The Leader of the Chain Gang

by Bruce Porter



Authors and their books in front of the New York B. Dalton—Ability to sell, not literary merit, is what claims the bookstore's attention.

I hold with Charles Lamb, a wise bookseller does more for the community than all the lecturers, journalists and schoolmasters put together.

—John Cooper Powys

DICK FONTAINE, merchandising director of the B. Dalton bookstore chain, downshifted his burnt-umber Porsche 924 into the parking lot of the company's one-story office building south of Minneapolis and finished off a long lament on the dim commercial aspirations of book editors in New York. Wind whipped off the former prairie land, converted to office parks and housing developments.

"Everything you try to do to popularize books is going to be sneered at," said Fontaine, a 37-year-old former schoolteacher from South Dakota. "Most editors still have the elitist carriage-trade mentality. They don't want to be associated with the likes of Harold Robbins and Jacqueline Susann....But I don't give a damn what starts people reading. If it's a sexual high, voyeurism, I say 'Fine.' No one starts off by reading Proust."

Until recently, such philistinism would get about as much attention along Publishers Row in Manhattan as an unsolicited manuscript. But these days when B. Dalton says something book publishers and their editors pause to listen. A year and a half ago, the company passed Waldenbooks of Stamford, Connecticut, as the largest chain owner of bookstores in the country. As such, Dalton not only sells an awful lot of books, some 47 million, in its 364 shops, but together with the other chains, it is beginning to exert tremendous influence over what the country is reading. While the approximately 2,300 stores controlled by the different chains amount to only a fraction of the 20,000 bookshops listed in the American Book Trade Directory, they account for more than 50 percent of the stores doing at least $100,000 worth of business a year. Dalton, which grossed $174 million in 1978, sells about one out of every 10 hardcover books published. It is growing

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so fast—adding 60 to 70 new stores a year—that corporate executives back in Bloomington, Minnesota, never know exactly how many shops they have.

Last fall, the company made a bid to capture the pearl of the book trade when it opened its mammoth, 100,000-title dual-level store at 666 Fifth Avenue in New York City. "It's going to be a real dogfight," says Floyd Hall, the boyish-looking president of Dalton whose classmates in a recent Harvard executives' course had never even heard of his company. "We've been trying to get into New York for three years. This means we're finally going to be recognized by the best book market in the country."

It is too early to tell just who will survive in New York's already overcrowded book district. The new Dalton's has taken some business away from the Doubleday's across the street, but with 25,000 square feet located in the richest retail district in Manhattan, the Dalton outlet has a whopping rent bill. And despite its barrage of publicity, said Hall, the new store so far "is not a shooting star." The company hopes that other bookshops it plans to open in the city, including one in Greenwich Village, will generate more business for the main branch.

While bookstore owners are understandably nervous about the growth of the Daltons and the Waldens, it is in the publishing industry—and, more importantly, in the literary community itself—that the chains are having the largest impact. Corporate executives in the trade houses, many of which have also fallen under control of large conglomerates, tend to see the chains in a positive light. Their large number of stores and modern merchandising techniques generate more profits for the whole book business. "It used to be that commercialism was a bad word," says Roger Straus III, marketing director of Harper & Row. "You'd put all your energy into creating a book, and when it came time to sell the product, everyone ran out of gas."

Those concerned with the literary quality of books, however, fear a more Faustian consequence. Using the selling methods made famous by supermarkets, such as self-service, limited selection of big brand names, and rapid turnover of goods, the Daltons and Waldens make their money selling books with strictly mass appeal.

As the chains put pressure on independent bookshops and gain more control over the retail end of publishing, the shelf space reserved for that *other* kind of book—serious literature, poetry, and works of scholarship—gets smaller. Correspondingly, the pressure grows on editors to begin passing up manuscripts they know won't fit the formula.

"What the chains are doing is like the farmer who takes things out of the soil but doesn't put anything back in," says a top editor at Little, Brown. "If the booksellers no longer take risks trying to sell American letters, then the pantry starts to get bare. As an editor, you spend less and less time on the things you feel are of real cultural value and more on the stuff that will sell."

Historically, the great personal bookshops, whether bohemian salons or caterers to the carriage trade, have always seen themselves more as literary institutions than as outlets for pushing goods. While the chains buy only 20 to 70 percent of a publisher's seasonal offering, Scribner's on New York's Fifth Avenue buys every single title issued by the major houses and stocks authors to considerable depth.

Floyd Hall, head of our largest bookstore chain.

In Chicago, the Stuart Brent Bookshop on North Michigan Avenue has done almost as much to influence reading habits in that city as its book critics have. A loud, raspy-voiced son of a Kiev immigrant, Brent, 58, holds court around an oaken table in the back of his shop. As a bookseller, he sees himself somewhere between a literary messiah and the high-school English teacher he once was. He refuses to carry mass-market paperbacks and regularly goes around ripping Harold Robbinses and Sidney Sheldons out of the customers' grasps. When Saul Bellow's *Humboldt's Gift* came out, he sold 2,400 copies, mostly by going out and stopping passers-by in the street. "I can't tell you what a burden it is being the guardian of the human spirit in Chicago," he once shouted during a lunch in the ornate Drake Hotel.

In the Dalton stores, which are run by the Dayton Hudson department store chain of Minneapolis, it is, of course, advertising and promotion, rather than zealous managers, that are supposed to sell books. "There's nothing in the chains that has to do with tears or suffering or the human spirit," says Brent, who is currently fighting off competition from a new Dalton's one block away. "The pain and the agony the authors put into books—the feelings! How do you equate that with turning a profit?"

No titles are tolerated that don't earn their shelf space, and stores are stacked on a demographic formula that reduces reading habits to simple mathematics. Its outlet in a working-class neighborhood of Troy, Michigan, for instance, is stocked with almost triple the number of home-improvement books and auto-repair manuals found in its middle-class store five miles away. Dalton also knows working-class readers buy more dictionaries than middle-class people who purchased theirs long ago, and they seek more comfort from religion: Bibles sell four times better in the working-class store, as do books containing "inspirational sayings."

While the stocks may be different, all Dalton stores, big and small, look pretty much alike. On entering, customers are assaulted by a cacophony of cheeriness, the insistent message that books can be *fun*. Throughout the store, colored pieces of cardboard dangle from the ceiling depicting smiley green worms chomping on books or little red engines carting around books in their tenders. Here and there, a large display hawking a TV tie-in leaps out at customers.

"Traditionally, bookstores have been stuffy places with parquet floors, heavy fixtures, and a little old lady who's been there 30 years," says John Pope, Dalton's advertising director who formerly promoted Wheaties and Toro lawnmowers. "You felt you had to *know* books before you could go in. What we've done is take the awesomeness out of the book-buying experience."

The real commercial success of Dalton, however, can be attributed to its IBM 158 computer, which stocks the books and dictates how they are displayed. Keyed into the cash registers of all Dalton stores, the computer knows how many books have sold in 100 categories, from Philosophy to Rocks and Gems. With that information, headquarters can detect an early blip of interest in a book and begin shoving it under customers' noses simultaneously in all 364 stores. The object is to see if a better-than-average seller can be hyped into a bonanza. "Given a lot of display, any book will sell," says Jeffrey Hohman, a senior buyer for the chain. "The trick is to find out what book will sell best and put it where people can see it."

To do this, the computer is cued to lift

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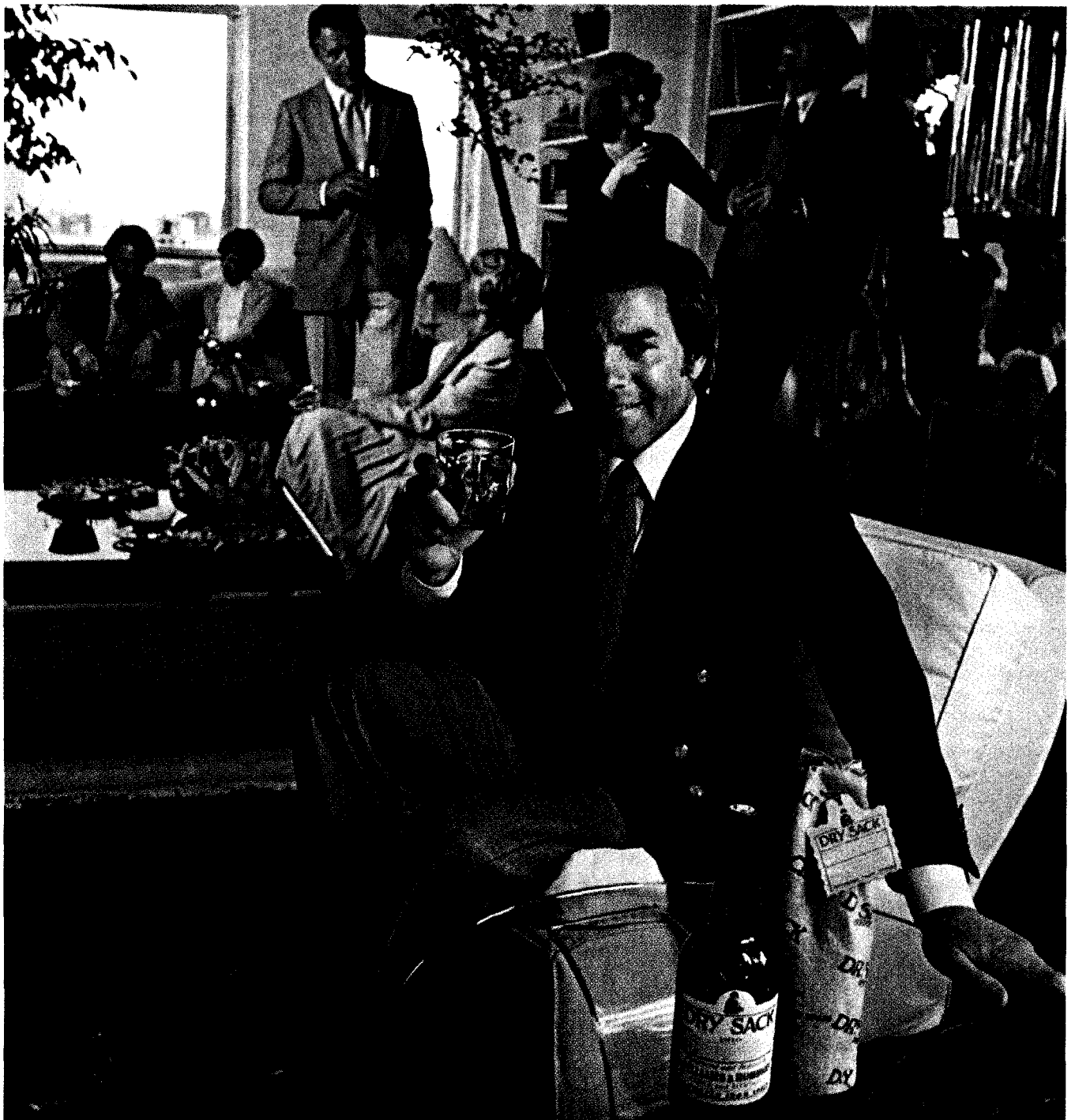

On second thought, make it Dry Sack. The change of pace drink that's second to none.

Chances are, you're accustomed to drinking the best. So when you want something lighter than your usual, such as wine or an aperitif, why not order the best?

Dry Sack is known for its superb balance. A rich, yet dry taste—with a character that can stand up to ice.

Dry Sack. The light drink with the reputation equal to your usual drink.

DRY SACK
Imported from Spain.

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out of the gaggle of new titles those books that sell more than 80 copies a week and place them on what the store calls its "hot list." The hot-list books get placed on special racks near the front of the store to attract attention. Then, once the buying gets even hotter than hot, the books move to Dalton's best-seller list, a special honor that thrusts them into the front window and into displays that confront people directly when they enter the store.

At the bottom line of such strict economic determinism lies a very thin selection of books. A large Dalton store, such as the first one opened in Edina, Minnesota, carries as many different titles as Scribner's in New York City—about 40,000—but serious readers would look in vain for anything of real interest. Most of those 40,000 Dalton books fall in such categories as pop-psychology, how-to, cookery, and gothic romances; the store has the best selection of "me-first" books in Christendom (*Looking Out for No. 1, See You at the Top*). A recent visitor found nothing in the hardcover history section, for example, about Napoleon, Mao Tse-tung, Benjamin Franklin, the French and Russian revolutions, or any of the British kings or queens. The only general American history book was the *Reader's Digest Story of America*. But there were 19 books about the Nazis. "Hitler," said the Edina store manager, "is very big this year." In paperback, the Current Affairs/Political Science section was so sparsely stocked that *Das Kapital* and *On Revolution* by Hannah Arendt were lumped together with *Dog Days at the White House: Memories of the Presidential Kennel Keeper.* The store's Movie/TV section contained more books than the section for the History of Civilization.

"I think of the chains as doing for reading what the fast-food operations have done for eating," says John Dessauer, author of the yearly *Book Industry Trends*, and the unofficial statistician of the book trade. "You can preach to them about cultural obligations, but with their economics, they really can't afford to mess with pâté de foie gras."

Dalton rarely considers buying a book with a printing of fewer than 10,000 copies, and the ones it buys heavily have almost always generated plenty of interest inside the publishing industry.

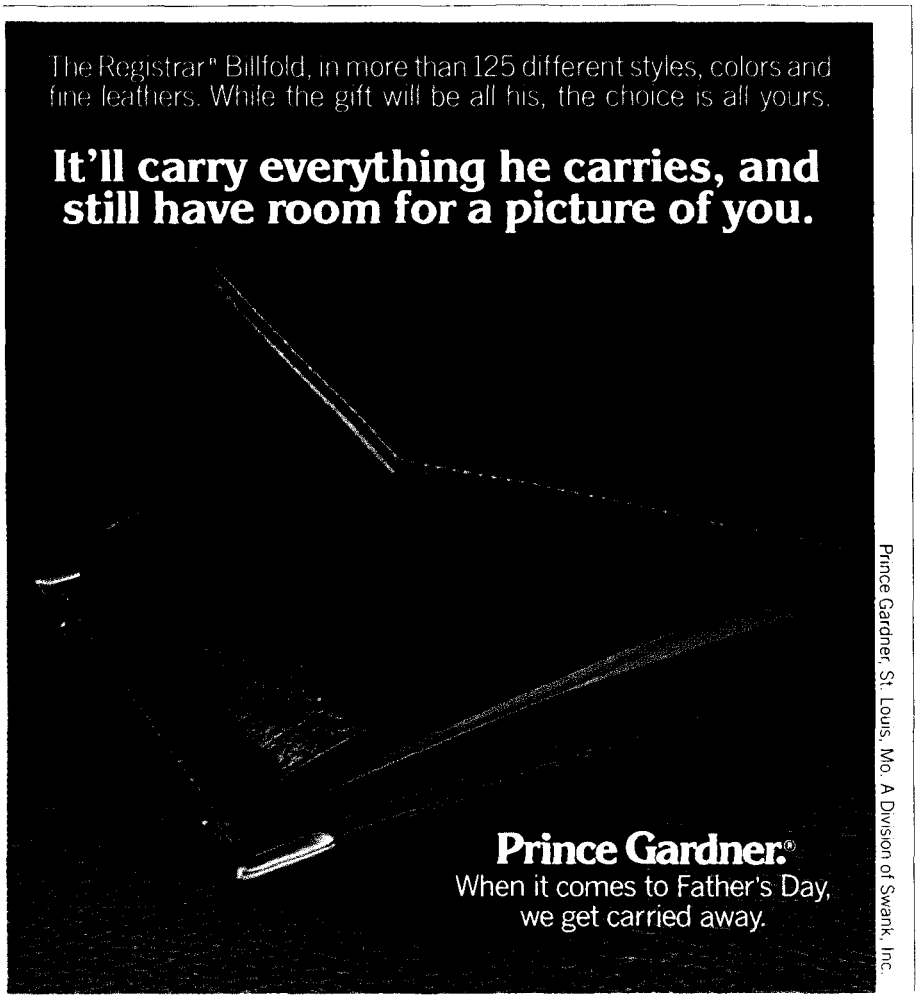
"When they buy books, they don't want to hear about plot outlines, they want to know your advertising plans," says Roger Straus III of Harper & Row, whose *Thorn Birds* drew $1.9 million in a paperback sale before Dalton bought it. "If I walked into Dalton's and told them what a great cry the book was, they'd laugh me out of the place."

If a book has not been built up by its publisher before publication Dalton will stock the title heavily only if it has a strong regional appeal or receives rave reviews after its release. In 1977, when Knopf sent around *Dispatches*, Michael Herr's compilation of his grim *Esquire* pieces on the Vietnam War, Dalton agreed to buy only 700 copies, hardly enough to put it in all its outlets. "It was a depressing book," says John Shulz, merchandising director for the chain. "And it was coming out at Christmas, when no one wants to read depressing books." Depressing or not, the book was praised across the country as one of the most important works on the war. By mid-February it had moved to the front of Dalton's best-seller racks.

Hardest hit by the chain formula are books of poetry. Of all the titles carried by Dalton's Edina store, there was only one by John Ashbery, and that a paperback. Other victims are first novels, whose printings rarely run to more than 8,000 copies. Some editors think the dampening effect on new novels is all to the good. "What's in trouble because of the chains," says Herman Gollob, editor-in-chief of Atheneum, "is that gentle, sincere, highly introspective work with no narrative power and no psychological insights." And as far as he's concerned, it's good riddance. "I'm always amused by the people who call themselves avant-garde or experimental writers. They have nothing but contempt for the reader, and then they complain that no one buys their books."

Others, though, are worried that chain pressure is seriously eroding the commitment some publishers still have to encouraging good new writing, even if it is not immediately profitable. "There are lots of writers who are not terrific now but who will be terrific in five years," says Gene Young, a former editor at Lippincott and Harper & Row who is now with Little, Brown. "If you don't do something to encourage them, they tend to go off and do something else with their lives." One of her favorite exhibits is John McPhee, whose writing habit, until his recent book, was supported by *New Yorker* magazine rather than by his 12 previous books which, while highly praised, sold only marginally.

Whether the Daltons and Waldens are driving the independents out of business is a sorely debated point in the trade. Dalton likes to say that the hoopla it creates for books spills over to other shops as well. But because of the bigger discounts Dalton can command from publishers, its massive outlays for advertising, and the sheer size of its stores, few independent bookshops celebrate when the chain moves down the block. Shortly after Dalton arrived in Portland, Oregon, for instance, the three dominant independents went out of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business, as did one on Long Island, two Doubledays in St. Louis, and another in San Francisco after the chain opened up in those places.

In 1977, when Dalton unveiled a gigantic $1 million-a-year bookstore on Chestnut Street in Philadelphia, the owner of a small bookshop a half block away got cold comfort when he complained the new store would hurt him badly. Said Dalton's East Coast man Brad Johnson: "I told him he had to specialize. I said we had 12,000 square feet and he had only 1,600 and he couldn't compete." But he said, 'I've been here 15 years as a general bookstore and I can't change.' I could tell by talking to him that he didn't want to hear it." ◉

Bruce Porter, director of the journalism program at Brooklyn College, collaborated on The Blackout Looting! *which was published last year by Gardner Press.*

War Games

The Sideshow: Nixon, Kissinger and the Destruction of Cambodia
by William Shawcross
Simon & Schuster, 467 pp., $13.95

SOPHIE BAKER

Shawcross—Documentary devastation.

Reviewed by Fredric M. Kaplan

EVEN IN THE imagination, Cambodia has usually existed as an extension of some other place. Angkor Wat. French Indochina. The Vietnam War. Nixon—and the killings at Kent State—brought Cambodia to the front of the American brain in the spring of 1971. Eight springs later, it's still more or less there, albeit dank, remote, and lately bound up with the awful insinuations of former dictator Pol Pot's "autogenocide," the discomfiture prompted by Vietnam's invasion and occupation, and then, on the national news in January, the figure of a Khmer prince receiving attention somewhat out of proportion to what the situation seemed to warrant.

Cambodia, its past and our memories notwithstanding, still exists. Right now babies are being nursed, rice is being planted, and the country is—after all that's passed since 1969—still fighting for its life. That Cambodia's present subjugation lies at the hands of its Communist neighbor is a fact from which William Shawcross would allow us to derive little consolation. Not at least until our own guilt is understood and accounted for.

In *The Sideshow* the author presents an exegesis on U.S. policy-making and—by extension—U.S. war-making in Cambodia, from the inception of Nixon's secret bombing in 1969 through the collapse of Lon Nol's government in 1975. The subject is forbiddingly difficult, especially since its central protagonist is Henry Kissinger, an archvillain in the saga by Shawcross's reckoning but, to the end, an illusive figure measured by the shadows he cast over the actions of others. Despite the subject's inherent difficulties, we are left with as assiduous and ambitious an effort as now exists on the subject. If Kissinger is never precisely nailed in *The Sideshow*, the book does leave him rather severely trussed up for subsequent dissections over his Cambodia policy.

Shawcross's point is this: Foreign policy-making under Nixon proceeded in such a way that "accidents of personality had a marked effect on the conduct of the war [in Cambodia] itself." Put more precisely, the workings of Kissinger's ego—coupled with Nixon's self-described "madman" policy-making—were more directly responsible for the devastation in Cambodia than were geopolitical necessities.

The Sideshow builds methodically on the premise that the United States became involved in Cambodia for reasons extraneous to Cambodia. Thus, "political and organizational requirements" in Washington—laid over with internecine bureaucratic and personal rivalries—were key determinants in America's prosecution of the five-year bombing war (1969–73) and its six-year support of the regime of Lon Nol (1970–75). Thus Kissinger's barely disguised contempt for Secretary of State William Rogers and overall distrust of policy evaluations derived through State and Defense department channels led in time to out-of-hand rejection of criticisms and suggestions from virtually anyone not linked to the White House inner circle. Shawcross documents how, immediately upon Lon Nol's successful deposition of Sihanouk in 1970, Nixon and Kissinger rushed U.S. support to the new government despite direct warnings from the U.S. chargé d'affaires in Phnom Penh and Assistant Secretary Marshall Green's prediction that such actions would compromise Cambodia's neutrality and thus invite a dangerous broadening of the war.

In the subsequent period, as Washington became inundated with reports of the counterproductive effects of the bombing and arms build-up on political contingencies in Cambodia, the response of Nixon, Kissinger, and the Joint Chiefs was to press for more B-52 missions and more arms—compounding the corrupt propensities of Lon Nol's government (before the 1970 coup, Lon Nol had himself profited directly from arms trafficking with the North Vietnamese) and subjecting the Cambodian population to a holocaust that could result only in brutalizing and/or polarizing those it did not kill. At one stage in the Cambodian "campaign" B-52 sorties reached 81 per day, compared with a maximum of 60 per day in Vietnam. In 1971 alone, two B-52 squadrons dropped the tonnage released by all U.S. planes in the entire Pacific Theater in World War II.

The secret "Operation Breakfast" bombing of 1969 (accompanied, as was later revealed, by the White House's deliberate falsification of Pentagon records) and the April 1970 invasion of Cambodia by U.S. troops were both later officially justified as necessary to protect the U.S. troop withdrawal from Vietnam. Also $1.7 billion in economic and military aid to Lon Nol was supported by the argument that Cambodia's fall would compromise a stable peace in Vietnam. Ultimately, it was the Nixon Doctrine that was perceived to be at stake in Cambodia—that Asian anti-communism and nationalism could, with U.S. aid and material alone, hold the line against international communism. And so, driven thus by some privately contrived logic, Nixon and Kissinger ignored their critics and hurled yet more bombs into Cambodia. Following the signing of the Paris accords in January 1973, Nixon needed a means of bolstering this doctrine. The bombardments over Cambodia (they had been banned over Vietnam) were taken up with new ferocity. When asked why, the CIA's William Colby replied, "Cambodia was the only game in town."

Shawcross's book is not a quick read. A multitude of levels lends reality to the total canvas—the offices of Nixon and Kissinger; the Joint Chiefs; State and Defense; the U.S. command in Vietnam; the U.S. missions in Phnom Penh; the maze of Cambodian factors like Lon Nol, Sihanouk, and the Khmer Rouge. The resulting picture is necessarily complex

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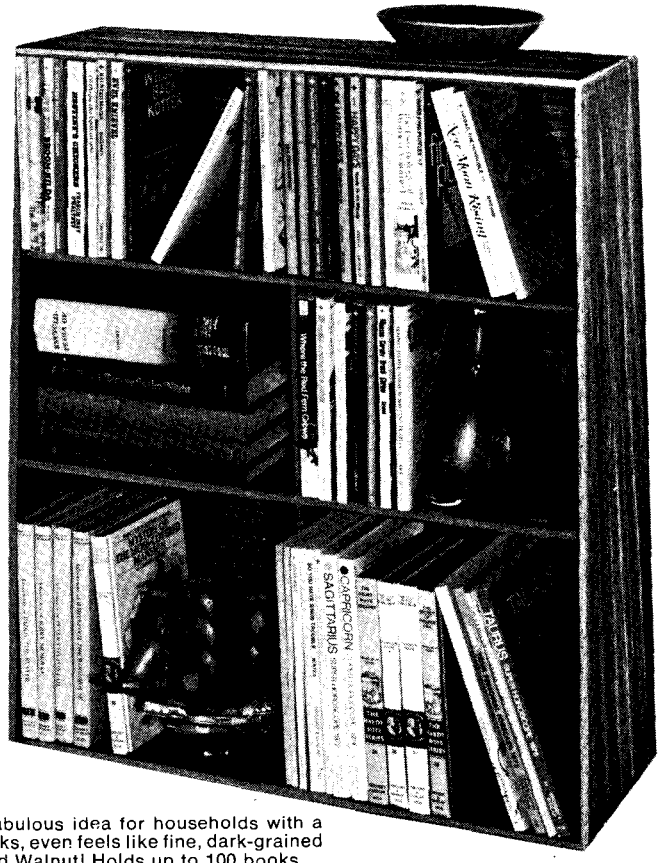

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and often fragmented. The author's attempts to link events with staccato tension get tangled in background discourses, and venues switch before characters become distinct.

The net effect is eerie, anxiety-producing, and ultimately unsatisfying. Hundreds of thousands were left dead by the communal arrogance of a small circle of U.S. political and military leaders whose views were, after all, not very far from the core of public opinion. Once conjured up by Shawcross, our anger still searches for the right mark. Kissinger to this day insists that an unchecked war on neutral Cambodia was justified in that it saved American lives. Whose arrogance is it that permits these judgments to be rendered with such airy, unblinking confidence?◉

Fredric M. Kaplan, president and publisher of Eurasia Press, has written extensively on Asia.

Unspinning Tidy Theories

Testimony and Demeanor
by John Casey
Knopf, 256 pp., $8.95

Reviewed by Judith Gies

IN *AN AMERICAN ROMANCE*, John Casey's dense, ambitious first novel (1977), the male protagonist observes that civilized people believe their minds can contain the world. Because Mac feels calm only when he is active, he considers himself a barbarian. But his need for "effort and patience and ordered accumulation" keeps him in balance and attracts the restless, mercurial Anya, "a connoisseur of her own taste, a traveler in her own sensations."

Anya recalls a fairy tale "in which a man in a forest notices more and more out of the corner of his eye [and] jerks his head further and further around until he's wound up like a corkscrew....The only way to avoid that," she concludes, "is to let go of your original notions, the ones that hold your feet."

Mac disagrees, and Casey's preoccupation with this kind of Lawrentian polarity also dominates his first collection of stories. All are narrated by stolid, intelligent young men concerned with spending their energies correctly, but unlike Mac they think they *can* contain the world in their minds, and they have devised comfortable methods of keeping life at a safe distance. For each the moment of truth is a confrontation with other human beings who force them to let go of their original notions and leave them with their tidy theories unspin-

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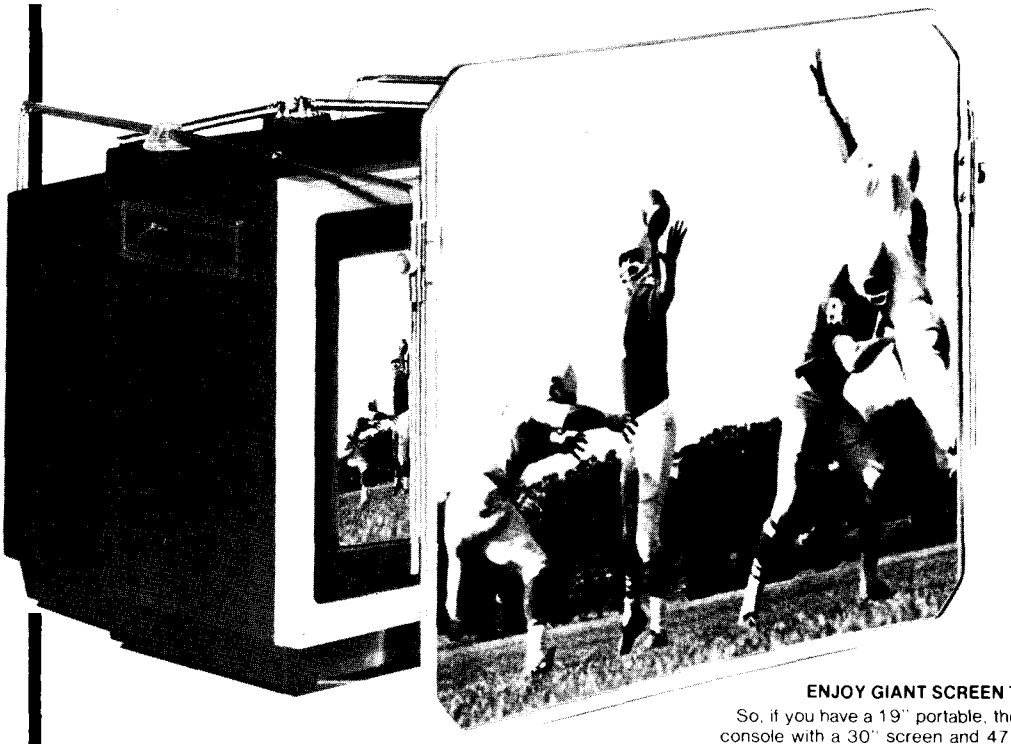

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CAMILLA SMITH

John Casey, whose style is both cerebral and sensuous.

ning like Anya's corkscrews. For some, the sensation is exhilarating, for others, painful. For all of them, the author seems to be saying, it is a necessary rite of passage into the turbulence of life.

Casey's style—both cerebral and sensuous—gives him a rare facility for articulating physical and emotional landscapes, a gift impressively demonstrated in his novel. The relentless self-examination of his central characters sometimes made *An American Romance* heavy going, but the book was redeemed by the overflowing of ideas, characters, beautifully rendered evocations of the Iowa landscape, and acute insights into coming of age in the early Sixties.

The constraints of the story form pose a challenge to his rangy style. Three of the pieces were published in the *New Yorker* between 1968 and 1971. The fourth is really a novella. Previously unpublished, it is set in Iowa, and the key scene resembles an incident in *An American Romance*. An earnest English professor is first amused, then captivated by the attentions of a fatuous young woman student who finally drifts off to pursue other enthusiasms, but leaves him a different person. Having once suffered from a kind of agorophobia engendered by the vastness of space and time, he ends by re-running a student movie in which his protegée appears.

> The very last shot is of a road—a straight, unstoppable bright ribbon rising and falling and reappearing crest after crest. I've since realized that three arcs of road can suggest endlessness. There is no greater suggestion of openness or promise, unless it's the flat undersides of the clouds seeming to extend the design beyond the horizon, promising more space in which it is certain that the road continues to rise and fall.

He will not do anything very dramatic; he will not join the girl in her current adventure, but he runs the film "backward and then forward again. Here is how I secretly worship, by these clouds and arcs of road, although this is just the image of them."

This is Casey's writing at its best—taut and suggestive. The other stories—of a young field officer whose men, resenting his distance, destroy it; a hard-working young lawyer whose affair with an older woman makes him realize that "I...did not have to be so grimly thrifty with myself"; and an HEW worker who suddenly perceives the futility of his ordered ambitions—all stick close to the same theme, though with varying degrees of success.

Although Casey has tightened his style to suit the story form, the ponderous quality that beset the novel is sometimes a problem here too, with less space for developing characters and action to offset the priggishness and self-absorption of his protagonists. And his ambitious theme—no less than the ancient tug of war between the apollonian and dionysian—almost seems to demand an omniscient viewpoint. First-person narration is a risky business, and readers will probably disagree as to whether or not the claustrophobic, onanistic effect it creates best serves the author's purpose. In any event, this collection is consistently intelligent, and marks Casey as a writer of rare power and perception.◉

Judith Gies is a freelance writer and reviewer living in New York City.

The Opiate of Optimism

Optimism: The Biology of Hope
by Lionel Tiger
Simon & Schuster, 318 pp., $9.95

SIGRID ESTRADA

Lionel Tiger—Puts the cart before the horse.

Reviewed by Terrence Des Pres

COMPARED TO Lionel Tiger's earlier books, *Optimism: The Biology of Hope* is largely disappointing. Certainly it is not, as the title implies, a work of science. At best it is entertaining, a collage of speculations about the biological basis of human behavior. At worst it is a rambling surfeit of guesses, a *de profundis* of truisms, rhetorical questions, and gratuitous asides, informed by no sense of proportion whatsoever. Tiger's aim is "to show how bits of behavior can be lifted out of the course of events and shown to contain optimism"; and on the assumption that "nature makes people do what it is good for the species to have done," he puts the cart before the horse, takes for granted exactly what the science of sociobiology seeks to prove, and proceeds to speculate freely on whatever comes into his head.

Hope, he argues, is genetically determined, and the optimistic mood is created by chemical reactions in the brain. I expect he is right, but of course hard data are lacking, and as mere speculations these ideas lead Tiger into clumsy corners. If, for example, optimism is a chemically induced deadening of response to life's terrors, it comes in conflict with mechanisms that intensify awareness, pain in particular. Perhaps this is a real problem, but Tiger's solution is no solution at all: "Insofar as pain is itself a warning system to organisms that something is wrong, then the secretion of substances that overcome the warning system is an interesting check of one evolved process by another. It suggests an interesting way in which natural living systems are able to maximize their opportunities to deal effectively with their environments." For all his use of technical jargon, in the crunch Tiger falls back on the doubtful authority of words like "interesting."

There is a runaway character to this kind of thinking. In 10 pages Tiger piles up God, Freud, the power of illusion, brain mechanisms, and quotations from other of his own books. In the space of a single page, as if there were no distinctions to be made, he moves from "the rhesus monkey" to "many people" to "young children" to "studies of rats and of human newborns." Professor Tiger is extremely knowledgeable, and the sad thing about *Optimism* is that it seems to strain toward the sort of "major statement" that eminent persons, at the peak of their careers, feel compelled to produce. Tiger's remarks are often provocative and wise, but just as often he ends up pontificating in the following silly way: "The eruption of slavery was in part a result of the wellsprings of human greed, evil and heartlessness. But it was also an artifact of the human sweet tooth. The sudden possibility of making available very widely very concentrated processed sugar wrenched the world. The consequence of a passion for sweetness, human slavery corrupted society after society." Is he serious?

The "ingredient of promise" is clearly central to human action, and Tiger's am-

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biguous yes-and-no attitude toward optimism is perhaps his most useful insight: Hope, as he sees it, is nature's way of getting us to carry on amid harsh and dispiriting circumstances; but hope is also the capacity to prefer illusion, a sort of self-induced blindness regarding things-to-come that insists upon bigger and better futures. Thus Tiger speaks of "the opiate of optimism" and tells us that hope may reflect a "design defect" in the brain. He goes so far as to argue that inflation, indeed the world's current economic crisis, has been caused by "the optimistic urge into money."

No doubt life programs itself to take an unduly bright view of its own uncertain future. No doubt we prefer the comfort of fictions. But Professor Tiger misses the point of his own critique. In times like ours, hope is both dangerous and indispensable. We must not lose faith, but neither can we afford to live in illusions. Between these extremes comes the reality principle, a kind of modest, controlled, adult view of the world that we nonscientists simply call "being realistic." And after all, might not the capacity for realism, as the product of experience and biological maturity, be another of nature's needful gifts? I think we must hope so.◉

Terrence Des Pres is the author of The Survivor: Anatomy of Life in the Death Camps. *He lives in Hamilton, New York.*

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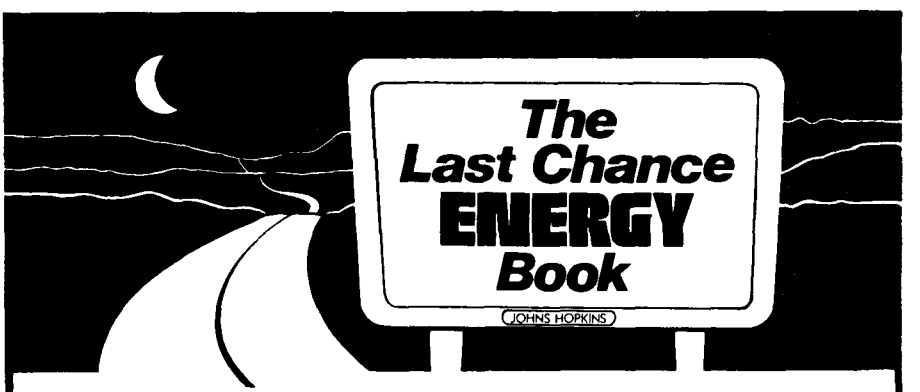
Books in Brief

Only Children
by Alison Lurie
Random House, 257 pp., $9.95

ALISON LURIE, the uncommonly astute satirist and author of *The War Between the Tates, Imaginary Friends,* and other books, has taken a new path in this less acidulous and less successful novel, by relating the story largely through the observations of two eight-year-old girls. Two families spend the July 4 weekend of 1935 in the primitively appointed country house of a progressive-school director, a character intended as an earthy enchantress who in fact turns out to be insufferably wholesome.

To create an atmosphere of summer evening magic, Lurie invests objects and incidents with a symbolism that weighs down the simple realities of the situation. A series of confrontations and flirtations precipitates private crises all around, from which one family emerges mildly scratched, the other deeply scarred. Though the time is the Depression, the themes embodied in the adult characters—nature versus artifice, social commitment versus hucksterism, the choices open to women, the shifting



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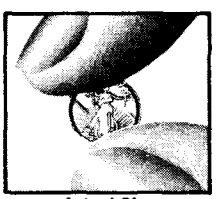

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dependencies and autonomies in marriage—are thoroughly contemporary and sharply delineated.

The novel moves from the inner lives and quicksilver perceptions of the beautifully drawn children—one a frightened, dreamy escapist, the other a spunky pragmatist—to the ponderous maneuvers and dialogues of the stereotypical grownups. In the most compelling passages, the children's literal imaginations work eerie, dangerous transformations from casual remarks misunderstood. However, the necessary simplicity of their expression grows tedious, compared to Lurie's subtle authorial voice, especially since the girls' roles are limited to thwarting their parents' predictable passions. Despite problems, *Only Children* does achieve a mood of enchantment in its second half, with strange metamorphoses as in Shakespearean and J.M. Barrie fantasy, or the fairy tales woven throughout the girls' play. One misses Lurie's customary complexity and wit, but must admire her willingness to risk this quite different and difficult conception.

—LYNNE SHARON SCHWARTZ

Hirshhorn: Medici From Brooklyn
by Barry Hyams
Dutton, 199 pp., $11.95

JOSEPH HIRSHHORN has had one of the most spectacular careers of our time, and one of the most controversial. A Latvian child of poor immigrants who settled in Brooklyn early in this century, Hirshhorn made a fortune in the stock market before he was 30, then went on to discover and develop some of the richest mines in the world, accumulating both passionate supporters and bitter enemies along the way. His business career has been marked by scandals involving stock manipulation, and his private life was clouded by a protracted divorce suit and a long rupture with his children. Hirshhorn, never one to bow to the pressures of power or of love, remained undaunted by troubles and censure and plunged ahead, diverting a large part of his energies into the collecting of art.

Perhaps the most important art patron of our time, Hirshhorn is the only one of the American collector-tycoons who bought contemporary American art by the square mile. A major motive in his sharp trading seems to have been the building of a personal monument, somewhat in the tradition of Henry Clay Frick. (In one sense, he outdid Frick—the federal government picked up a substantial portion of the tab for his Hirshhorn Museum and Sculpture Garden in Washington, D.C.)

A penetrating biography of Hirshhorn, besides revealing the man,

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could tell us a great deal about American art and money in our times. This muddled book falls far short of that. The author has spent a great deal of time with Hirshhorn but this seems only to have confused his viewpoint. The lackluster narrative telescopes back and forth, interrupted by fragmented telephone conversations in which Hirshhorn quotes stock and art prices, buys and sells. After a few pages, the reader neither knows nor cares what the author is trying to say.

Making a bad matter worse, Hyams's knowledge of business, art, and matters of the heart seem sadly inadequate to his task. He can offer no overview of his subject, and so depends upon Hirshhorn's word and present perspective. Hyams reduces Hirshhorn's accomplishments and disappointments to anecdote and caricature. Given Hirshhorn's stature as one of the last in the American tradition of pioneers, the book will be read for its factual content. But its subject, Joe Hirshhorn, deserves better.

—BONNIE BURNHAM

A Bend in the River
by V.S. Naipaul
Knopf, 288 pp., $8.95

SEMPER ALIQUID NOVI—always something new out of Africa, the Romans told us. This year we've had James Ngugi's stunning *Petals of Blood*, John Updike's best-selling *The Coup*, and now Naipaul's new novel—his seventh—*A Bend in the River*, which adds another sequence to his saga of the transcendentally homeless "mimic men" (as the Trinidad-born writer calls them in an earlier book) of the emerging nations.

Salim, an East African of East Indian descent (which means that he feels, in his own words, like a man with "no family, no flag, no fetish") buys a general store in a large town in the interior of an unnamed African country. A man without any "home ground" to stand on, Salim builds his business out of the rubble left by one post-independence revolution. He discovers a great deal about his own mundane existence and about that of his circle of bewildered young Africans, bedraggled European ex-patriates, and displaced East Indians, as the town (and the country) lurches toward yet another cataclysmic revolt.

Naipaul has written about Africa elsewhere (among other places, in a marvelous novella titled "In a Free State," published in hard cover in 1971), but never with such sustained insight and subtlety. As far from the verbal drum-pounding of Updike's novel as Ipswich is from Dar es Salaam, Naipaul's book about life and death in a temporary outpost in the African forest emerges as the real coup of the season.

—ALAN CHEUSE

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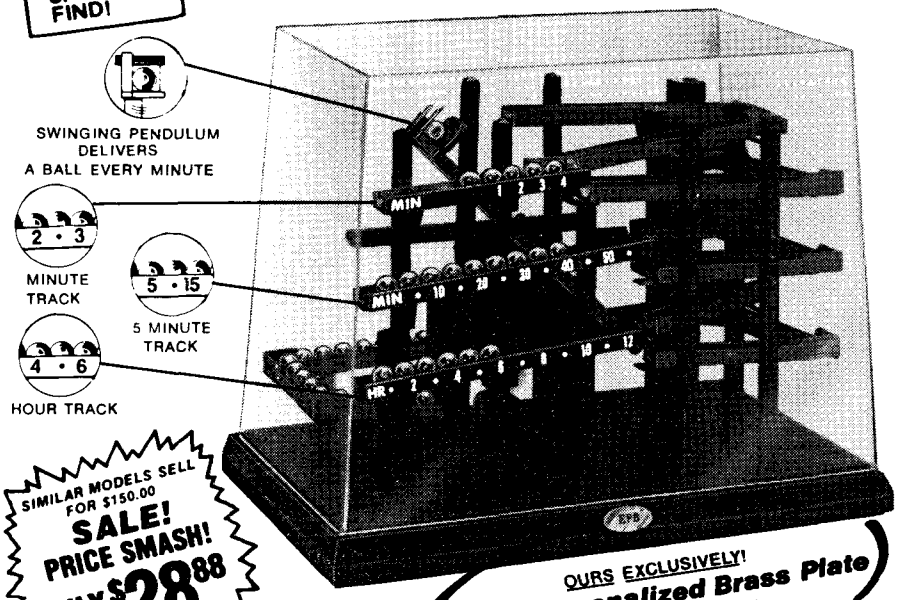

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The Grapes of Rothschild

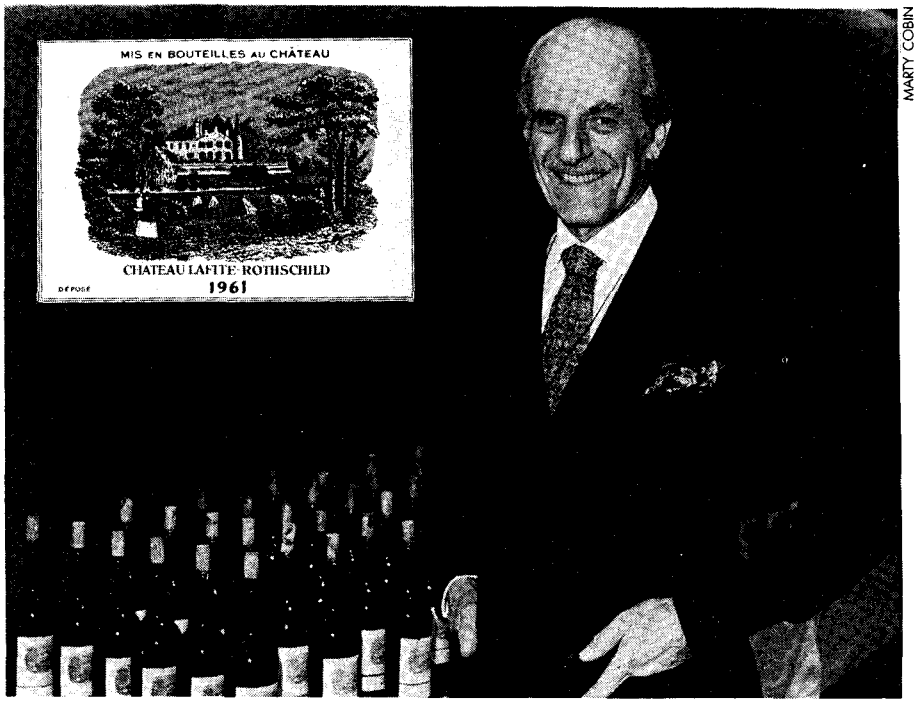
BARON JAMES de Rothschild, who had emigrated from Frankfurt to Paris during Napoleonic times, and who had originally been called Jacob, lived in high style. For seven years his personal chef was Marie-Antoine Carême, often called the founder of the classic cuisine, who had cooked for the Prince Regent of England, later George IV; for Czar Alexander; for the British Embassy in Paris; and for the Court of Vienna.

To Baron James, Balzac dedicated stories. Heine spoke warmly of him. His art, his furniture, his mansions were among the most magnificent in Europe. And so when it came to buying a vineyard in 1868, the same year James died, the Rothschilds chose Château Lafite, the most prestigious of the First Growth estates, which 13 years earlier had achieved its Bordeaux classification.

The Rothschild name was not added to the label until years afterward, but Château Lafite had acquired a reputation that has survived and grown in the last hundred years. In 1877, Disraeli, 73, ailing and depressed, was taken off all medicines by his doctors, who prescribed instead "the finest Château Lafite." The following year, Disraeli was being hailed as the "lion of the Congress of Berlin." Bismarck, always his adversary, said of him, "What a man!"—not knowing that it was the elixir of the Rothschilds that had helped the British prime minister to regain his strength.

Today the Rothschilds like to point to the ink-stained table at Ferrières, the family mansion eight miles from Versailles, which had been requisitioned during the war of 1870 for the use of the King of Prussia, Von Moltke, and Bismarck. Here the preliminary negotiations that were to result in the Treaty of Frankfurt were being worked out when Bismarck discovered that it was the Rothschilds who were guaranteeing the food supplies being sent to a beleaguered Paris and who, moreover, were underwriting the indemnity demanded by the Germans. When Baron Alphonse, James's son, refused to speak German and airily dismissed the matter of the money as of little importance, Bismarck was infuriated and smote the desk with his fist, spilling the ink and creating an historic ink spot.

James's great-grandson, Baron Elie de Rothschild, has shaped the destiny of the Château Lafite vineyard from the years following the second German war until 1975. Under his management such celebrated vintages as 1945, 1959, and 1961 were developed. But the vineyard was scarcely a fountain of Rothschild riches. The first dividend since the time of the purchase in 1868 was not paid until 1948, and then it amounted to only 2,000 francs per share. There are six shares, two owned by Baron Guy, and one each by Alain, Elie, Edmond, and the Baroness Dorothy. Together they divided about $3,000.



Elie de Rothschild and 1961 label—"Sheer drama! Rich, concentrated. Has everything."

Now a new generation has been handed the managerial reins of the estate. Elie's nephew, Baron Eric de Rothschild, is well prepared. In addition to spending much of his time in the family's Médoc vineyards, he has also completed his courses at the Institut National d'Oenologie.

These two current generations still maintain the tradition of style, taste, and grandeur. This spring the two barons de Rothschild, Elie and Eric, arrived in America on the Concorde. They had prepared an event of typically Rothschildian dimensions. Seventeen different vintages of their beloved Lafite-Rothschild claret were to be served to 60 of America's leading wine experts. The logistics were extraordinary.

The 102 bottles of wine had been sent from Bordeaux three months before so that they might rest quietly before their exposure to the jury of 60. (Their total value on today's market is conservatively estimated at $12,000.) Each of the bottles was uncorked several hours prior to the tasting so that it might breathe and have its bouquet fully expressed by the time we were ready for it. Each bottle was poured into a decanter and waiting by the time we arrived.

Abdullah Simon, the recognized dean of wine importers, was the host for the proceedings that took place in a large, well-lighted tasting room in the Seagram building. Over 1,000 graceful tulip-shaped glasses had been readied. In front of each taster there was a glittering array of 17 of the thin-stemmed goblets, each identified by vintage. Only the most austere of food—bread and cheese—were on the table, as well as, of course, the necessary paper and pencil for note-taking. Had the experts committed the sin of actually *drinking* all the wine set before them, each would have swallowed just under 41 ounces.

It is difficult enough for even a knowledgeable wine drinker to objectively appraise six simple wines in an hour. It is obviously much more demanding to put into perspective the nuances and variances of 17 different, complex wines,

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such as Lafite, in a single morning. The difficulty is further compounded by the fact that all the wines were of one family, making even more puzzling the problem of drawing fine distinctions. We submit what follows partly because history demands that this occasion should be somehow memorialized in a fitting (or lafitting) manner; and partly to give the reader a sample of a curious and perhaps dubious sub-genre of English prose: the wine taster's notes.

The wine represented the past four decades: the '70s, '60s, '50s, and '40s. The order of tasting was from the youngest, 1976, to the oldest, 1945.

Aaron's personal ratings (geography prevented Fadiman from doing anything beyond indulging in a fit of the sulks) listed below refer to a range from 0 (dismal failure), to 20 (sheer perfection). A wine rated 17 or more can be considered great indeed. For those who find it of interest to know the current selling price of each wine, we list before each rating the bottle value.

The First Round—the Seventies

1976 Wears a rich crimson robe. Not as big in depth as the previous year, 1975, but will be ready to drink sooner. Good for 20 years. ($30/17)

1975 What a wine! Strength and intensity are obvious. Much tannin to show that it will outlive most of us. May prove to be a worthy successor to the immortal '45s and '61s. ($50/19)

1973 Light, well-balanced, with delightful bouquet. Delicious now. A pleasant, low-keyed version of a great Lafite. The finesse is there, but the body is not. Drink it by 1983. ($20/16)

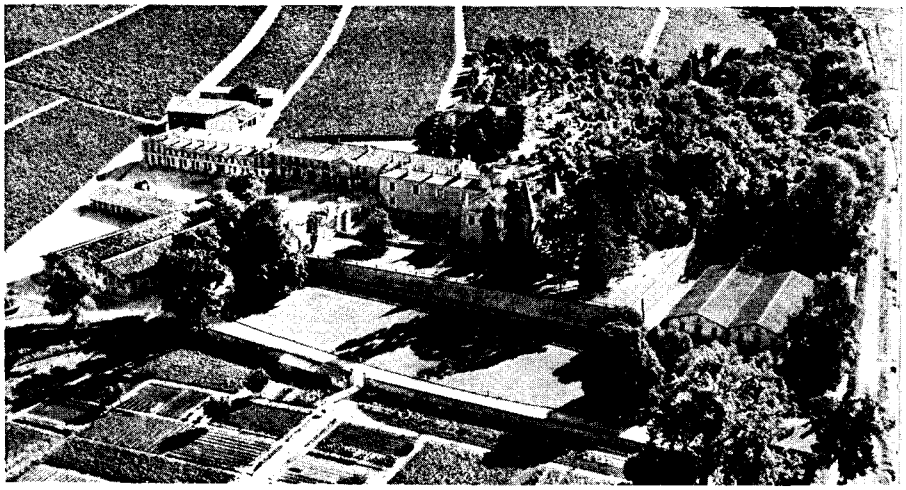
1971 1970 enjoys the role of prima ballerina; the '71s—less publicized—have not yet graduated from the ballet corps. In our opinion, future history may reverse the roles. Very complete, very "Lafite." Beautifully balanced, great future. Drinks well now. ($35/19)

1970 Shares with 1975 the honor of being the best two vintages of the decade. Has lots of "baby fat" and tannin. Baron Eric de Rothschild thinks it is a "sleeper" and will emerge from its cocoon to be a great wine within a few years. We still back the '71. ($50/19)

The Second Round—the Sixties

1967 In our opinion, the poorest of the Lafites shown at the tasting. Has little of the elegance, grandeur, and glamour usually associated with Lafite. Light, gentle, pleasant—but not of great stature. ($30/15)

1966 Here is the case of an ugly duckling that became a swan. In its early life closed-in, "green," and unprecocious. Like a burst of lightning, it now emerges with balance and style. Sufficient tannin to indicate it will mature slowly and gracefully. ($60/19)



Château Lafite—"In 1868 the Rothschilds chose the most prestigious of estates."

1964 There was heavy, incessant rain during midvintage, which diluted what could have been an extraordinary year into one of simple excellence, without uniqueness. A bit short on the nose and flavor. Rather good balance, but not a Lafite to evoke poetry. ($50/16)

1962 An amazing wine! In our opinion, shares honors with 1949 as the best of the Lafites for present drinking. Wonderful, soft, rich, buttery quality. Bouquet utterly magnificent. We'd buy a case—if we could find one. ($55/18)

1961 Sheer drama! Rich, concentrated. Has everything. Will not reach its true peak for at least another decade. A glory. ($150/20)

The Third Round—the Fifties

1959 Proclaimed as the "vintage of the century." There are still those who nominate Lafite '59 as the "wine of the century." Rich, fruity, complete, elegant. Some at the tasting were heard describing this '59 as "redolent of wood violets." But is this wine worth the price? Is a Picasso worth *its* price? ($220/20)

1955 Classic. A polite wine that will please the traditional Bordelaise, but is a bit too numb to please us. Excellent?—yes! Remarkable?—no. ($150/17)

1953 What a beauty! Like Pablo Casals at the age of 90 on the beach. Of perfect equilibrium, but nearing the end of its life. Will be a fond memory in a decade—meanwhile, it gives a lovely light. To be critical of this wine would be *lèse majesté*. ($200/19)

1952 Hard, giving the feeling that the wine was made from unripe grapes. Tannin, rather than fruit, dominates. Will it ever reach balance and maturity? We hope so—but we question it. Not one of our favorites. ($150/16)

The Fourth Round—the Forties

1949 The 60 participants were polled and voted this '49 the best of all the 17 wines tasted. We cast our ballot with the majority. The floweriness, elegant richness, and authority leaped right out of the glass. The wine is 30 years old, yet tastes very young. Here is beauty and balance combined—Lafite at its best. ($300/20)

1947 One of the hottest summers on record in Bordeaux. Tastes like a "hot" wine—very raisiny. Very rich and color turning brown. Unique and dramatic in its own way. ($250/18)

1945 Bordeaux had much to celebrate—the ending of World War II, and undoubtedly one of the greatest vintages of the century. No sign of age; will be good for decades. Utterly remarkable. A historic wine. ($300/20)

When Baron Elie de Rothschild was asked, "What is your favorite Lafite?" he replied, "Which is your favorite child? But if I were forced to choose the three vintages that expressed the most, I would pick '93, '95, and '99." When asked the same question, Baron Eric de Rothschild, 25 years younger, enthused over Lafite '59.

It is said that an age-old rivalry between Château Mouton and Lafite was first based on the fact that Lafite was declared a First Growth in the 1855 classification of Bordeaux, while Mouton placed just below, and had to wait until 1973 to achieve that same exalted rank. At the luncheon held just after the tasting, Baron Elie de Rothschild explained that reports of intense rivalry between his cousin Baron Philippe, proprietor of Château Mouton, and him are grossly exaggerated. In truth, the competition is like that between owners of thoroughbreds—or Oxford vs. Cambridge.

A bottle of 1806 Lafite fetched $16,000 at a recent Christie auction. When we inquired of Baron Eric what was the oldest vintage Lafite he had ever tasted, he replied apologetically that he had never tasted the 1797, but that he did enjoy the lively excellence of an 1847.

Such enjoyment we concluded with a sigh, is, like the historic tasting itself, peculiarly Rothschildian.

—Sam Aaron and Clifton Fadiman

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Gilding the Gold Coast

THE MORE THINGS change, the more they are completely different. Call it Sutton's Law. There was a time when it was as unthinkable as it was a cardinal social gaffe to venture along the French Riviera in summer. The Polish counts and the Russian dukes and the chilled aristocracy from England came in winter, or at least in the early spring to greet the mimosa and each other. Now, come July, one can't find a place to park one's yacht at St. Tropez, and one is required to book days in advance to dine at one of Vergé's starred tables at Mougins.

Invading the Caribbean in the unlikely summer months was only for picaroons or squads of displaced persons hurrying home on family emergencies. The building of the Caribe Hilton in San Juan changed all that. For one thing it had air-conditioning. For another, it proved that trade winds blow in summer. And finally, those who ventured into what was assumed to be a cauldron returned without third-degree burns or visible evidence that the West Indian summer sun had addled the cerebellum or that they had been poached alive in the sea.

Rather, the first returnees were walking evidence that the Caribbean was not only bearable, it was enjoyable. The crowds had dispersed to soak up summer sun in northern climes, and the rates were a fraction of the customary winter extraction. Cost, as it turns out, may well spell the success of a summer season in the West Indies now that much of Europe has lofted its prices into the ozone.

I give you, as an example, the prime resort of Dorado Beach, one of the early ventures into spiffy tourism undertaken by Laurance Rockefeller. Like a number of other Rockefeller properties, the adjoining Cerromar Beach Hotel for one, and the splendid Mauna Kea on the Big Island of Hawaii, for another, Dorado has been passed along to other owners and other managers.

In the case of Dorado and Cerromar, these sister resorts are now operated by International Regent Hotels, an imaginative aggregation which, though functioning principally in the Far East, has lately moved into New York City with the Mayfair Regent Hotel on Park Avenue.

Under the Regent reign, Dorado, for the first time in its 20-year history, is offering a land package for couples, called, and you should pardon the trick word play—"Twogether." That means if two people travel together and use the same double room, the cost will be $525 per person, an extraction that includes transportation between San Juan Airport and Dorado—a 45-minute ride—seven nights and eight days at the resort, all meals, tennis and greens fees on the golf courses (normally $12), tennis clinics, courses in how to beat the house in the casino, and what you always wanted—disco dance lessons. Taxes and tips are thrown in, too.

Strolling the beach at Dorado—"Enough activities to frazzle a decathalon jock."

The assortment of activities is enough to frazzle a decathlon jock, for it includes water polo, snorkeling, volleyball, yoga, sunfish-sailing on the golf-course lake, water skiing, lagoon fishing, and a new jag for joggers called parcourse.

Already under sail, the program, which in its breathless list of frenetic activity, and its all-in price (wine, too), seems to be taking aim at Club Med's successes, continues into September.

There are other ways of doing Dorado, and one which I found especially appealing, is the nest called Villa Dorado. A cluster of 34 casitas, most of them privately owned, is released to the rental pool, and can be leased in summer at rates that are anywhere from $50 to $100 a day cheaper than what winter guests were paying. All are white and sparkling, each has a patio in back and a full kitchen with double ovens and an ice-maker to boot. In the current season a one-bedroom suite that sleeps four costs $90 a day. A studio costs $60 a day and a two-bedroom villa, shared, perhaps, between couples, is $135. The villas have their own pool and two tennis courts for the use of owners or renters at no charge. Shuttle service runs to the hotel every 20 minutes.

If one doesn't feel like keeping house, there is a variety of restaurants between the two hotels, not the least of which is Su Casa, the former estate house of the 1,600-acre property originally owned by Dr. Alfred Livingston who arrived in Puerto Rico in 1903.

With his daughter, Clara Livingston, who became an aviatrix of some note, Dr. Livingston lived on the property, which he called Finca La Sardiniera, for 50 years. He grew grapefruit which were first sent by rail to San Juan, then by ship to New York and on to London. The grapefruit were only orange-size, but London seemed to like them. New York preferred the Florida crop sent north in refrigerated cars.

When Laurance Rockefeller bought the plantation—so the story goes, at the suggestion of Robert Moses, the New York city planner and World's Fair entrepreneur, who spied it from a surveying airplane—he engaged Robert Trent Jones, at a reputed cost of $2 million, to build the first golf course. During the early years, the players would often come back from a round with grapefruit stuffed in their golf bags.

Now in her seventies, Clara Livingston still lives on the property in a house behind the lagoon where pelicans fly sorties. The beach nearby is still called La Sardiniera, a memory of Miss

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Livingston's girlhood days, as are the many trees, not indigenous to the island, which her father had imported from Asia.

A dozen years after he had unveiled Dorado as the golden resort of a new Puerto Rican gold coast, even creating a logo that was derived from the alchemist's sign for gold, Rockefeller and company put up an expansive convention hotel next door called the Cerromar. It had 508 rooms, nearly twice as many as Dorado. It also claimed the largest convention center between Miami and Buenos Aires.

There was plenty of golf—two 18-hole courses for each hotel, 72 holes in all. Some of the fairways are lined with private homes, one owned by Laurance Rockefeller, another by the famed Puerto Rican pro, Chi Chi Rodriguez. A settlement of private homes, elsewhere on the estate, includes the huge manse of Raul Slavin, an Argentinian who dabbles in ships, warehousing, and real estate. His Dorado shelter is lined with huge white columns inset with vertical mirrors. Enormous boulders have been brought in for decoration, and although there is no swimming pool, the place has an air-conditioned squash court.

Even bulwarked by fascinating neighbors and equipped with playgrounds for adult sport, Cerromar never quite caught on. The Regent people have sought to dress it up, sinking $2 million in a general refashioning. El Bucanero, once a bar, has been transformed into a 24-hour deluxe cafeteria with a bamboo ceiling, mirrors on the walls, and a view of the sea reflected or head-on, no matter where you sit.

El Yunque uses the name of Puerto Rico's rain forest for a saloon that is festooned with hanging ferns, decorated with rattan, and covered with a glass dome.

For many visitors, that is about as close to Puerto Rico as they are likely to get. But even ensconced in a room at Cerromar this summer, at about $50 a day (50 percent off the winter price), an adventurer could wander off the property as far as the town of Vega Alta, where among the cognoscenti, the Restaurant La Familia has become something of a culinary discovery, serving lobster swimming in butter with yellow rice and fried plantains; *asapao* which it describes as "wet rice," although "soupy rice" might be a more appetizing translation. Lobster, conch, and shrimp with fried plantains, corn sticks, and garlic bread; stewed shrimp; squid in its ink; land crab and dry rice; and turtle steak—all part of the bill of fare—often make visitors wish they had enough days to work their way through the menu. It would be a nice way to fritter away the summer.

—Horace Sutton

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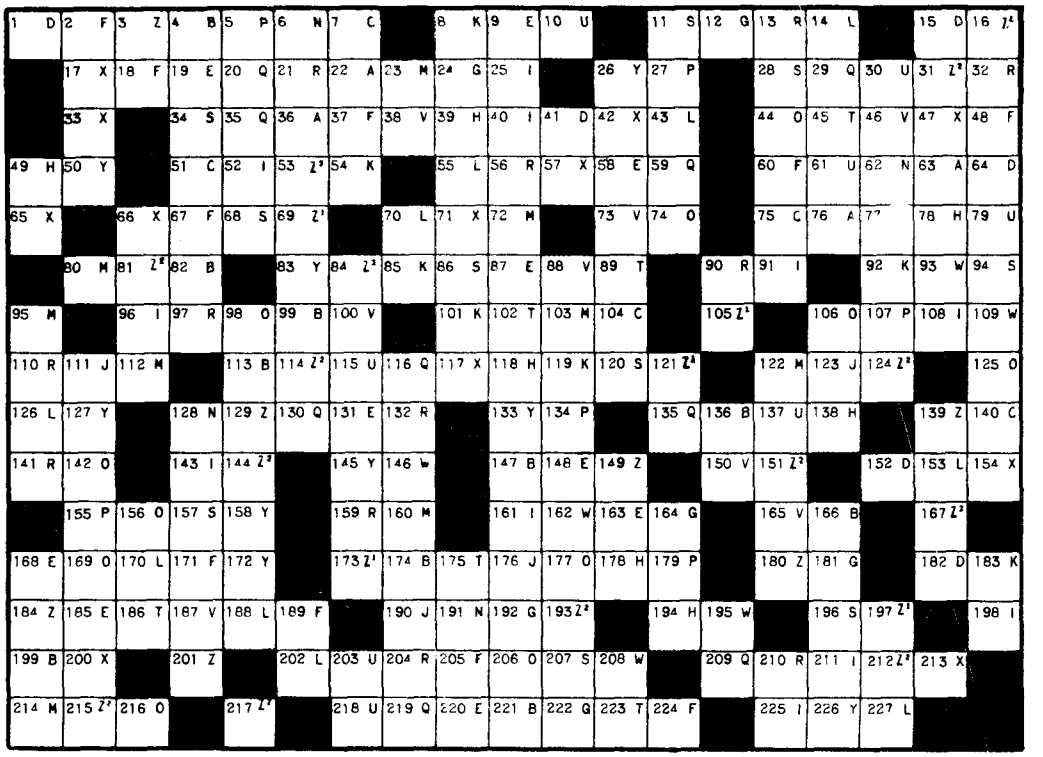
DOUBLE-CROSTIC NO. 173

by Thomas H. Middleton

Instructions:
If you've never solved one of these puzzles, it will probably look much more difficult than it actually is. If you can answer only a few of the WORDS correctly, you're on your way to solving the puzzle. Fill in the numbered blanks of all the WORDS you can guess and write the letter of each numbered blank in its correspondingly numbered square in the diagram. The letters printed in the upper-right-hand corners of the squares indicate from what WORD a particular square's letter comes.
The diagram, when filled in, should read as a quotation from a published work. The dark squares are the spaces between words. If there is no dark square at the end of a line, a word may carry over to the line below.
The first letter of each WORD, reading down, will spell the name of the author and the title of the work from which the quotation is taken.
You should find yourself seeing words and phrases taking form in the diagram; so you can work back and forth, from WORDS to diagram and from diagram to WORDS, until the diagram is filled in.

Answer to Double-Crostic No. 172 appears on page 5.



CLUES	WORDS
A. Archbishop of Canterbury, 1633-45, executed for treaon	22 36 63 76
B. Having a pleasant sound	82 99 113 136 147 166 174 199 221
C. Swagger, strut	7 51 75 104 140
D. First-class, first-rate, A-number-one	152 182 1 15 41 64
E. Informs	87 131 163 185 220 9 19 58 148 168
F. Exhilarating, stimulating	171 189 205 224 2 18 48 67 37 60
G. Arboreal marsupials of Australia	164 181 192 222 12 24
H. City in Suffolk, England	39 78 118 138 49 178 194
I. 1932 work by Saint-Exupery (2 wds.)	198 211 225 25 40 91 108 52 96 143 161
J. Scottish novelist (1779-1839; The Ayrshire Legatees)	111 123 176 190
K. Stands with shelves for bric-a-brac; etagères	8 54 85 101 183 77 92 119
L. Right as rain; hunky-dory (comp.)	153 170 188 202 227 14 55 70 126 43
M. One of the rare earth metals	72 80 95 112 160 214 23 103 122
N. Nibble at tidbits	6 62 128 191
O. Having suffered a financial loss (3 wds.)	98 125 142 156 206 169 74 106 44 177 216

CLUES	WORDS
P. Besides (2 wds)	27 107 155 5 134 179
Q. Mariners	209 219 20 116 130 35 29 59 135
R. English actor-director-producer ("The Angry Silence," "Seance on a Wet Afternoon")	141 56 32 110 13 21 90 97 159 204 132 210
S. Game fish (Seriola dorsalis) of Calif.	157 207 28 68 120 11 34 94 196 86
T. Greek island, legendary home of Odysseus	45 89 102 175 186 223
U. Source of poi (2 wds.)	203 30 61 115 218 10 137 79
V. Headings, titles, subtitles	88 187 100 73 165 150 46 38
W. Fastened with rope, cord, or the like	109 162 146 93 195 208
X. 1894 novel by George Moore (2 wds.)	17 47 200 57 117 42 66 33 213 154 71 65
Y. Talents, abilities	26 50 133 145 172 226 83 127 158
Z. Confused, shook	3 201 139 180 129 149 184
Z¹. Covers with fat	69 105 121 173 197
Z². "___ Yet Be Not Moved" (1845 Wordsworth poem; 4 wds.)	124 144 31 53 81 16 215 167 212 193 151 217 84 114

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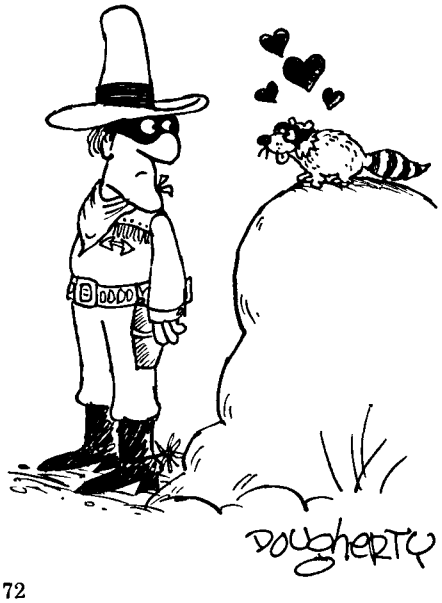
The End of Innocence

—Port-au-Prince

EVEN THE casual tourist in Haiti cannot ignore the poverty. The grandest avenues of the capital city are pocked with ruins of buildings, machinery, and men. Stand still in a public place and instantly you are besieged with beseeching peddlers and beggars; like flies they come, children, old men, strong youths who one can't help thinking should be more profitably employed than in the mongering of thumbed picture postcards. Even our comfortable and gracious hotel, Habitation Leclerc, self-consciously declares itself in its brochure as "a place for those who know how to enjoy luxury and perfect service without feeling guilt," as if to apologize in advance for the wretchedness that stops abruptly at the compound's guarded gates.

The visitor to Haiti has two options: either to dismiss the ever-evident reality as none of one's business and enjoy the island, or to wonder what on earth can be done to help.

The argument for the first option is in some respects persuasive. The visitor is not, after all, responsible for the local predicament. The most partisan and far-fetching theoreticians cannot plausibly pin blame for Haiti's misery on either the United States or France. And even if they could, it is inconceivable that the most charitably minded tourist could do anything in a short stay but compound any problems he tried to ameliorate. So why not wear blinders and thus avoid clouding a vacation with dark unuseful worries?



The problem with this option is that for most sensate souls it simply isn't an option. The Haitians are unforgettable. Even when they are out of sight, one is reminded of them by a constant cacophony of horn-honking, voodoo drumming, singing, clapping, dogs barking, shrieks of birds, shouts of men, laughter of children. The city seethes with such an enormous energy and involvement with life that one can't help suspecting nobody sleeps. Even the cocks (or their near cousins) crow the night through. The sounds force one to recollect the sights: the confident, bold colors that adorn taxis and the most dilapidated shacks; the hot dust; a rusting ship lying hopelessly on its flank in the harbor; a cinderblock foundation, overgrown with weeds, behind a weather-worn placard proudly announcing The Center for the Advancement of Something or Other. And always the people, grinning, jostling, importuning, dancing, going about their business with an ease and grace and good humor that make one forget for a moment that the minimum wage here, for those lucky enough to land a job, is one dollar a day, that the population of the island has nearly doubled in the last three decades (from 3 to 5½ million people), and that the living conditions of the majority during that period have deteriorated.

The complexity of Haiti is engrossing—the vitality and the poverty, the gay colors and the mean living conditions, the exuberance where one would expect despair. In other Caribbean countries, the visitor may be able to bury his head in sand, sun, and surf, but Haiti challenges one's ideology, forces Americans especially to test their beliefs against actuality.

How important, for instance, are what Carter calls "human rights," meaning political, religious, and intellectual freedom, in a country where the poverty literally stinks and where the population continues to burgeon? Was the brutal, tyrannical dictatorship of the late Papa Doc Duvalier worse than the instability of the dozens of governments and dozens of constitutions that the country endured in the 150 years before Duvalier's accession to power? A more frustrating question for Americans, most of whom believe in the solubility of all problems (ours and others): Is there anything the United States can do to relieve the human distress without turning Haiti into a welfare colony or a division of some multinational corporation?

For more than three centuries, we Americans were sometimes heroically, sometimes endearingly, sometimes egregiously arrogant. Our own astonishing successes persuaded us of our ability to succeed at any task we set our mind to. We believed that we could lick any wilderness, any invader, any foreign aggressor, even gravity; that we could police the globe, eradicate poverty, and drain the venom of prejudice out of human nature. Like the New York Yankees of legend, Americans never lost, at least not the big ones. But then we began to lose and, what was almost more galling than losing, to accept draws. The Cold War, Korea, McCarthyism, the war on poverty, Vietnam, Nixon. Divorce rates soared. So did individual income. But not contentment. And it goes on: The price of oil, the destiny of Africa, the security of our allies—all seem to be issues over which we have little control.

The religious might claim that we are, as a nation, discovering God by discovering our fallibility. Graduates of Introductory Psych might diagnose this period as our rite of passage from adolescence to maturity. Whatever label one assigns to our condition, the distress is no less acute. One yearns to *do something* for the Haitians' poverty, even while one recognizes that American meddling could all too easily corrupt the precious resiliency, humor, and authenticity of the people.

The quandary admits no easy answer. Thanks to our recently acquired self-consciousness, we lack the assurance to impose our solutions on problems that we only faintly understand. Doubt may make us too cautious, even ineffectual. But having learned to doubt, we cannot retreat back to cocky innocence. The recognition of frailty, what the psalmist called "The fear of the Lord," is the beginning of wisdom. The complexity of Haiti reminds one how essential wisdom is if we are to contribute usefully to a world whose ultimate shape we cannot ordain. If there are any sure ways in which the United States can help alleviate Haitian poverty, it will take intelligence, sensitivity, and time to discover them.

—Carll Tucker

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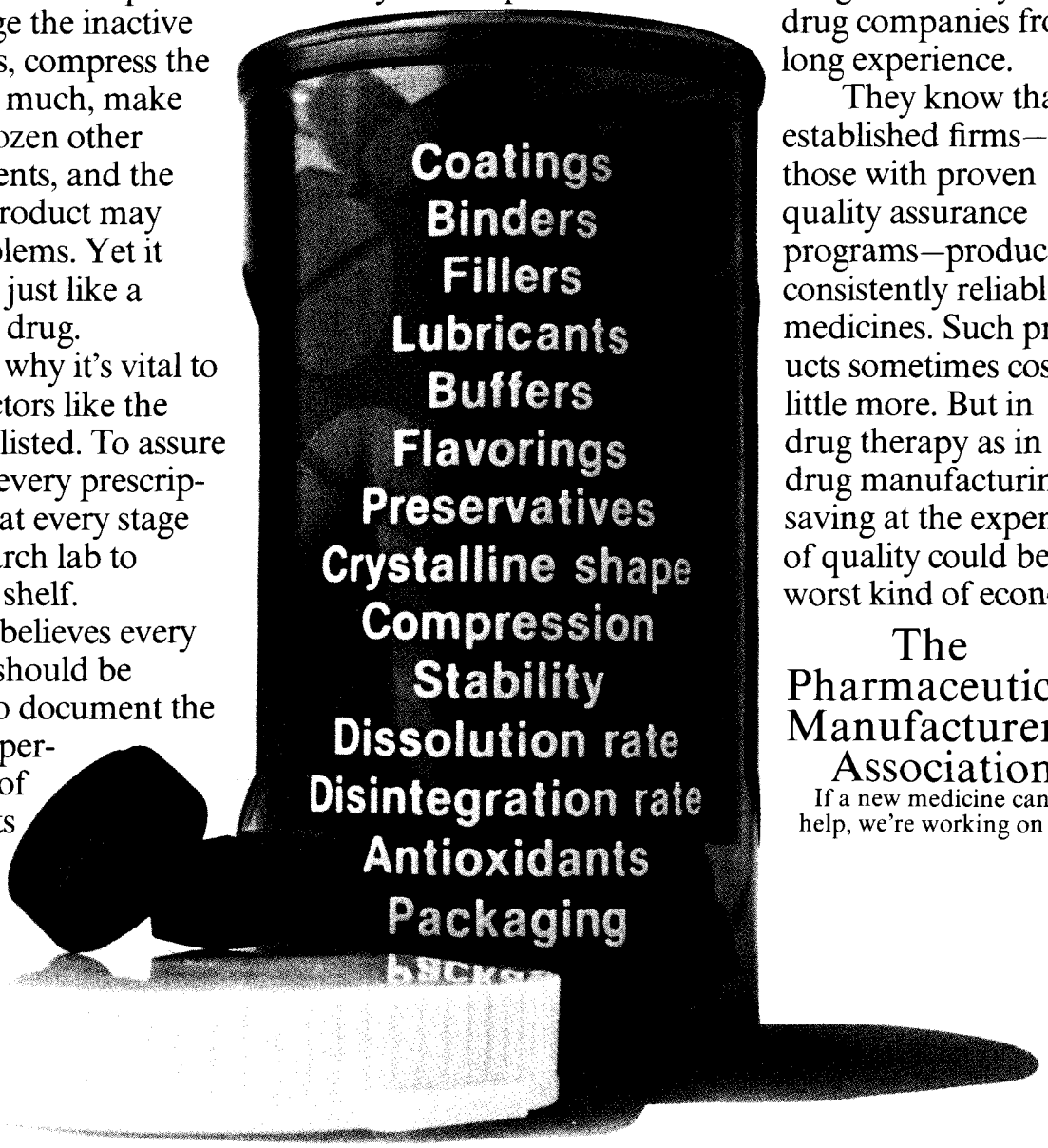

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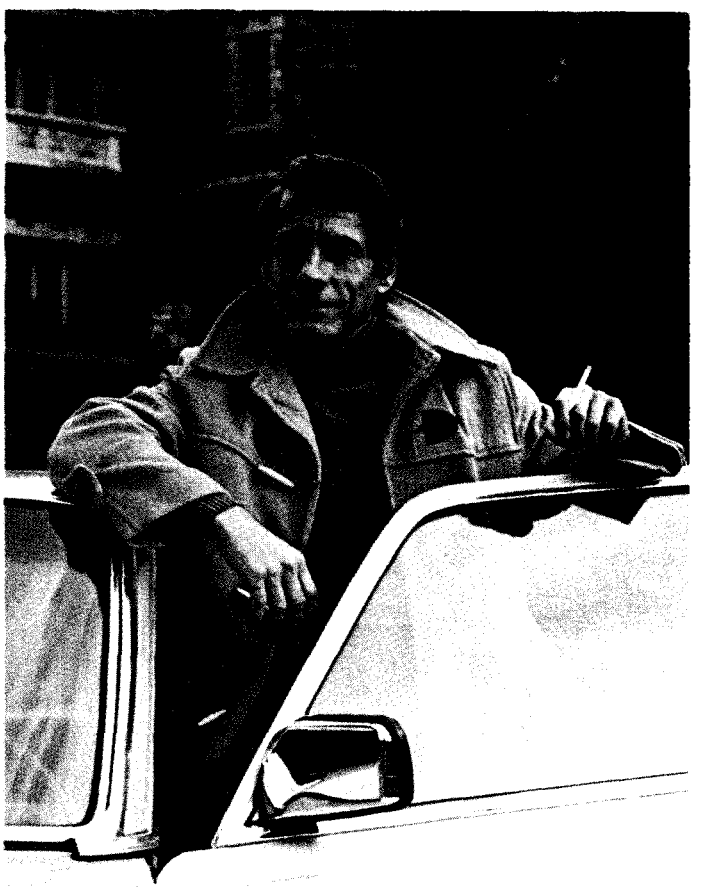

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